AD-A047 438 DOUGLAS AIRCRAFT CO LONG BEACH CALIF F/G 20/4
USER'S MANUAL FOR A FULLY AUTOMATIC THREE-DIMENSIONAL POTENTIAL--ETC(U)
AUG 77 D MACK, S M SCHIMKE N00014-74-C-0059
UNCLASSIFIED MDC-J7644/01 NL

1 OF 2
AD
A047438

August 1, 1977

Report No. MDC J7644/01

USER'S MANUAL FOR A FULLY AUTOMATIC THREE-DIMENSIONAL POTENTIAL-FLOW CALCULATION METHOD

Part 1. With Viscous Correction by Two-Dimensional Boundary-Layer Analysis

by

Dun-Pok Mack and Suzanne M. Schimke

This research was carried out under the Naval Ship Systems Command General Hydromechanics Research Program Subproject SR 023 01 01, administered by the Naval Ship Research and Development Center.

Contract N00014-74-C-0059

Approved for Public Release: Distribution Unlimited

DOUGLAS AIRCRAFT COMPANY

MCDONNELL DOUGLAS CORPORATION

August 1, 1977

Report No. MDC J7644/01

USER'S MANUAL FOR A FULLY AUTOMATIC THREE-DIMENSIONAL POTENTIAL-FLOW CALCULATION METHOD

Part 1. With Viscous Correction by Two-Dimensional Boundary-Layer Analysis

by

Dun-Pok Mack and Suzanne M. Schimke

This research was carried out under the Naval Ship Systems Command General Hydromechanics Research Program Subproject SR 023 01 01, administered by the Naval Ship Research and Development Center.

Contract N00014-74-C-0059

Copy number

Report number (14) MDC-J7644/01

(6) USER'S MANUAL FOR A FULLY AUTOMATIC THREE-DIMENSIONAL POTENTIAL-FLOW CALCULATION METHOD.

Part I. With Viscous Correction by Two-Dimensional Boundary-Layer Analysis.

Revision date

Revision letter

Issue date (11) 1 August 1977

Contract number (15) N00014-74-C-0059

Prepared by : (10) Dun-Pok Mack and Suzanne M. Schimke

(12) 187 p.

(13) Final rept. Oct 73-Mar 77,

Approved by :

T. Cebeci
Chief Aerodynamics Engineer
Research

F. T. Lynch
Chief Staff Engineer
Research and Development Programs
Aerodynamics Subdivision

(16) SR-2301

(17) SR-2301-1 vol 2

O. R. Dunn
Director — Aerodynamics

DOUGLAS AIRCRAFT COMPANY
MCDONNELL DOUGLAS CORPORATION

11640

ABSTRACT

This report describes a computer program which calculates the viscous effects on the lift and pressure distributions of arbitrary three-dimensional bodies. The program is a combination of a panel method which computes the potential flow about arbitrary three-dimensional lifting configurations, and a two-dimensional boundary-layer method, which calculates the viscous-effects. These effects are applied to the three-dimensional shape in a "strip-theory" sense and the resultant viscous lift and pressure distributions are produced. Two methods of simulating the boundary layer in the final potential-flow calculation are available: 1) addition of the displacement thickness to the original shape, and 2) defining a surface blowing distribution on the body.

The computer program is written in Fortran IV for the IBM 370 systems. 16 temporary external units are used for storage. The region size needed to execute the program is about 360K bytes, but this is a direct function of the number of elements defining the configuration.

Also presented in this report is a detailed description of the program logic, complete instructions for executing the program, and a sample case.

TABLE OF CONTENTS

1.0 INTRODUCTION

A procedure has been described [4] for the calculation of the viscous effects on the lift and pressure distributions of arbitrary three-dimensional configurations. This report is the user's manual for the computer program for this procedure which combines Hess' three-dimensional low-speed panel method [1] with Cebeci's two-dimensional boundary-layer method [2],[3]. The program automatically corrects the calculated potential-flow field for the displacement effect of the boundary layer. The corrections are made along streamwise strips of the lifting configuration where the boundary layer is assumed to be two-dimensional.

The logic of the program can conveniently be described in three steps. In step 1, the geometric quantities which define the configuration and the desired freestream flow conditions are input, and velocities and pressures are calculated at the control points of the body. The second step then determines the stagnation point of each lifting strip and, together with the previously calculated surface velocities, input quantities are generated for use in the boundary-layer program where a distribution of displacement thickness is determined. In the final step the calculated displacement thickness is used to simulate the boundary-layer effect. This effect may be simulated by either the addition of the displacement thickness to the original body coordinates to generate a new shape (referred to as the surface displacement method) or by the generation of a new set of source densities (blowing method). In either case a final potential-flow calculation which includes the viscosity effects is made.

The program has been prepared for use on the IBM 370 series digital computers and is written in Fortran IV. It makes use of overlays and requires 16 external storage units. The core size requirements depend on the number of elements that define the configuration but about 360 bytes may be needed. Single precision arithmetic is used. The time for a computer run is a function of several variables (element number, lifting strips, boundary-layer simulation methods, etc.) but a "typical" case of 500 lifting elements should take about 15 minutes.

The purpose of this report is to outline the use of the program and, in particular, to provide complete input instructions and a detailed explanation of the output. The technical background of the method for which this program is written and a discussion of some calculated results is presented in reference 4.

2.0 PROGRAM DESCRIPTION

This program couples a three-dimensional lifting potential-flow program [1] and a simplified version of a finite-difference program for calculating compressible laminar and turbulent boundary layers [2], [3] with a program which simulates the effect of the boundary layer on the flow. Two alternate subroutines allow the boundary layer to influence the potential flow by a displacement of the surface coordinates or by a simulated surface blowing. The program first computes an initial potential-flow solution, then solves two-dimensional boundary-layer equations in streamwise strips, to generate a distribution of displacement thickness over the body surface. This displacement thickness is used either to generate a new set of geometry coordinates or to calculate a simulated blowing velocity over the original body surface. The final potential-flow calculation is then made with the chosen boundary layer procedure producing the simulated viscous flow.

2.1 Potential-Flow Calculation

This part of the program is similar to that described in ref. [1]. It takes the body geometry coordinates, forms the velocity matrix, solves for the source density distribution, and computes the pressure coefficient at each of the element control points.

2.1.1 Subroutines and Their Functions

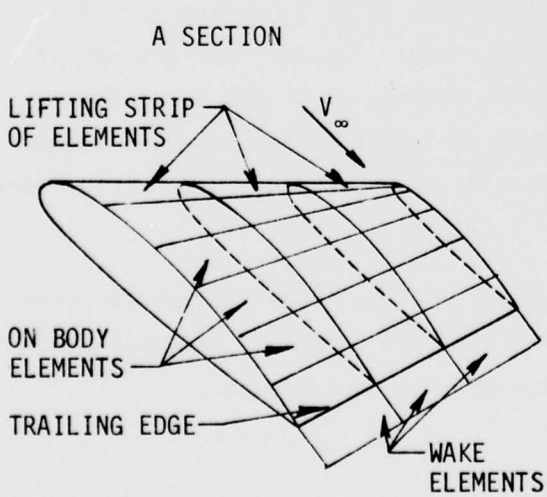
Following is a summary of the routines and their functions:

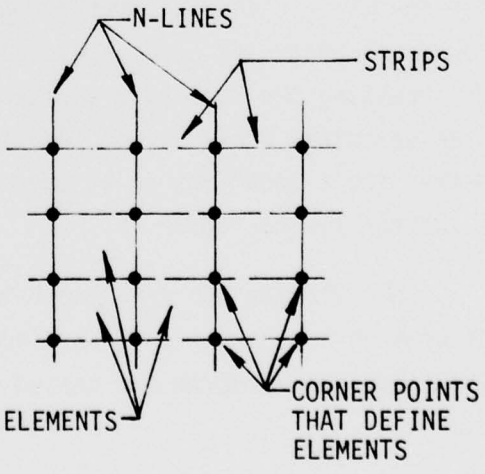
Name of Routines	Functions
BDFORM	Directs the input to form the body geometry.
INPUT	Accepts initial card input of the body points.
DINPUT	Takes in the body points with δ^* added on.
LIFT	Forms the lifting elements.
NOLIFT	Forms the nonlifting elements.
VFORM	Generates the velocity matrix.
VFMNLF	Forms the nonlifting velocities.

Name of Routines	Functions
VFMLFT	Forms the lifting velocities.
AFORM	Generates the normal velocity matrix to be solved for density distribution.
MATSOL	Directs the program to use initial matrix solution, or to solve more right sides.
COLSOL	Solves the columnwise matrix.
SOLMOR	Solves further right sides.
COMFLO	Computes the final combined flows.
PKUTTA	Solves the bound vorticity coefficients for the equal-pressure Kutta conditions.
PRINT	Generates the final output.
HEADER LDAY	Generates header label.

2.1.2 Program Notes

The body geometry input consists of sections and strips. Each section is divided into a number of strips, and each strip contains a certain number of elements (on-body elements and wake elements). These elements are defined by their corner points which are input along adjacent N-lines, two of which define a strip. A number of these N-lines compose a section as illustrated below:





Details of the input are available in reference 5.

For the lifting section of the body, the elements are formed into strips which are aligned in a direction along the streamflow. Each strip must also have elements off the body surface which will define the trailing vortex wake. Calculation of the flow about nonlifting bodies, e.g. a fuselage, may also be calculated in a similar manner. In this case, however, no wake representation is necessary, and the elements need not be in streamwise strips. Further, no boundary-layer displacement corrections are made on the nonlifting sections. Calculations for configurations that have both lifting and nonlifting sections may be made in one computer run, i.e. a wing on a fuselage.

Other special features of the program include the use of "extra strips" to carry wing vorticity through the fuselage and "ignored elements" to handle such problems as pylon-wing intersections. Section 6.8 of reference [1] provides further information on this procedures.

2.2 Two-Dimensional Boundary-Layer Calculation

2.2.1 Program Notes

A modified version of the Douglas finite-difference method for calculating compressible laminar and turbulent boundary layers [2], [3] is used here with a simplified input subroutine. The only inputs required are: (1) reference velocity in ft/sec, (2) Reynolds number/ft, and (3) the transition locations. The reference velocity and Reynolds number are input only once for the whole case, but transition locations have to be specified for the lower and upper surfaces separately on each strip. The user has the option of inputting the desired transition location number, or he may let the program calculate a transition location. Thus, an eight strip wing case requires 8 transition locations to be specified for the lower surface, and 8 transition locations for the upper.

The velocity and arc-length input needed for the boundary-layer program is determined inside the program. These parameters are stored on external units in the simulation program and passed to the boundary-layer program.

In order that the coordinate and velocity data from the potential flow part of the program is compatible with the input and output of the boundary-layer part of the program, a constant, FC (foot converter) must be input to the potential-flow program. The boundary-layer program is dimensional and calculations are done in terms of feet, and the displacement thickness δ^* is output in feet. Reference velocity and Reynolds number are also in ft/sec and ft^{-1}, respectively, as stated before.

Two examples may help to clarify the situation. A straight untapered wing is given with the chord equal to 1.0 foot and a test Reynolds number equal to 1.6×10^6. The coordinates are input as they stand with FC = 1.0 and Re = 1.6×10^6. If the reference velocity is not known, any small value, i.e. 100 ft/sec, may be chosen. Since the program calculates only incompressible flow, the value of the reference velocity does not affect the results.

Now assume that a swept tapered wing is defined with the root chord equal to 42 inches and the tip chord equal to 21 inches. The Reynolds number is 18×10^6 based on the mean aerodynamic chord. First, the data must be converted into feet; this can be accomplished by inputting the data as given (in inches), and inputting FC = 12.0. In this case the mean aerodynamic chord is used as the average chord and the Reynolds number per foot is calculated based on this value. The mean aerodynamic chord is 32 inches which equals 2.67 ft, thus the input Reynolds number/ft would be $18 \times 10^6 / 2.67$ ft = 6.74×10^6 ft^{-1}. Again the reference velocity is given or some arbitrary small value is used.

2.2.2 Subroutines and Their Functions

Routines	Functions
BOUNDL	Controls program responsible for calling other boundary-layer-related subprograms.
INPT	Handles all input data to the boundary-layer program.
EINF	Calculates the transformed J-grid points.
IVPF	Generates initial velocity profile.
FLPR	Computes the fluid properties.
EDVS	Computes the eddy viscosity.

Routines	Functions
SHFT	Provides the initial guesses for each station.
MOMX	Finds the solution of the x-momentum equation.
TRNS	Computes the location of boundary-layer transition.
SLOP	Computes the derivative DYDX from X,Y input.
OTPT	Handles the results of the boundary-layer calculation.

2.3 Simulation Programs

2.3.1 Program Notes

This part of the program manipulates the data in and out of the potential-flow and boundary-layer programs. It first determines the location of the stagnation point of a lifting strip, then separates the lifting strip into two "boundary-layer" strips, starting at the location of the stagnation point and proceeding toward the trailing edge on both upper and lower surfaces. It also organizes the velocity and arc length data for each "boundary-layer" strip. Experience has shown that the boundary-layer program requires at least a 50-station solution for good accuracy. Accordingly, the program interpolates to obtain input at 50 prescribed percent arc length stations before entering the boundary-layer program.

Upon returning from the boundary-layer program, the calculated displacement thickness distribution of each boundary-layer strip is back-interpolated to the original control-point locations. The upper surface and the lower surface boundary-layer data is then transformed to properly represent the displacement thickness associated with each lifting element. The program now branches to either the blowing method of boundary-layer simulation or the surface displacement method, depending upon the user's choice.

If the blowing method is used, a new onset flow with the boundary-layer influence is generated. The program proceeds to solve for a new set of source densities, and the potential-flow solution with viscosity effects is obtained.

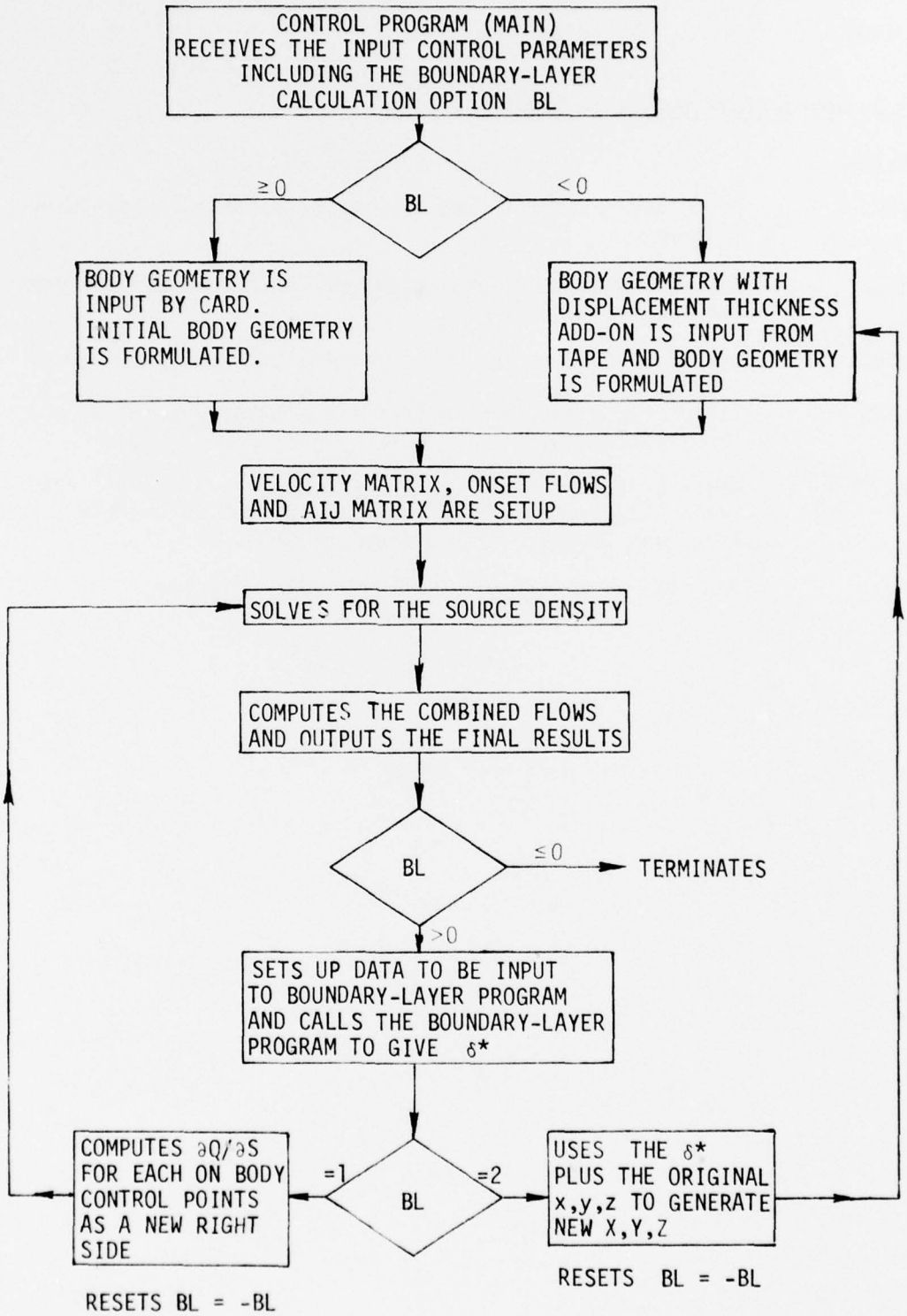
If the surface displacement method is selected, a new set of input body coordinates which have the displacement thickness added to them is generated and fed back to the potential-flow program. Another potential-flow calculation is them made with the new input body coordinates.

In either case, a complete set of the new potential flow output is printed.

2.3.2 Subroutines and Their Functions

Routines	Functions
SETUP	Links the potential-flow program with the boundary-layer program.
BSETUP	Processes the input and output of the boundary-layer program for blowing method.
DSETUP	Same as BSETUP except it is for the surface displacement method.
CALCRS	Calculates a new flow to be solved in potential-flow program (blowing method).
MODXYZ	Modifies the original x,y,z coordinates with δ^* added on and generates new X,Y,Z data to be used in the final potential flow run (surface displacement method).
WAC	Handles the two-dimensional data interpolation.

2.4 Program Logic Flow Diagram



2.5 Program Options

Listed below are the options the program provides. Explanation and the option selector (as input variable) are given along with each option.

1. Input moment origin
   (MØMENT)

   Program will use an input moment origin to calculate the moment components in potential flow part of the program. If chosen, set MØMENT=1 and input the x,y,z components of the moment origin.

2. Input Kutta points for wake-tangency Kutta conditions
   (KUTTA)

   When this option is used, set KUTTA=1 and input the x,y,z components of the Kutta points as well as the Kutta normals.

3. Input off-body points
   (NØFF)

   To input off-body points, set the input parameter NØFF=1 and input the x,y,z components of the off-body points.

4. Partial execution — basic geometry output only
   (LIST)

   For the purpose of examining some input geometry and not go through the whole program, set LIST=1 and the program will stop after body-element formation.

5. Intermediate Print, velocity matrix
   (MPR)

   Input MPR=1 prints the source velocity matrix V_{ij}
   MPR=2 prints the normal velocity matrix A_{ij}
   MPR=3 prints the dipole velocities.

6. Intermediate print, geometry quantities and sigma matrix
   (IØUT)

   When IØUT≠0, the element geometry quantities and the solution of the source density matrix will be printed.

7. Ignored element option
(IG)

When IG≠0, input the element numbers to be ignored. The program will set the source velocity on these elements to zero. This special option is for a nonlifting section intersecting a lifting section.

8. Special last wake element calculation
(LASWAK)

Input LASWAK≠0 and the program will use special formulas for semi-infinite last wake element. In most cases, this option is selected.

9. Multiple angles of attack
(IATACK)

If user only runs the potential flow part of the program, he may run it with more than one angle of attack. Set IATACK = number of angles of attack to be input. Maximum number allowed = 10. When using both potential flow and boundary-layer program, only 1 angle of attack is currently allowed.

10. Piecewise linear vorticity option
(IWIDTH)

If this is used, set IWIDTH≠0 and input the strip widths.

11. Step function vorticity option
(ISAVE)

Setting ISAVE≠0 will use step function vorticity.

12. Zero lift option

Setting ISAVE=9 will give the zero lift output in addition to the normal output. This option works only when the potential flow part of the program is run alone.

13. Symmetry features
(SYM1, SYM2)

Inputting SYM1≠0 will treat the input as one plane of symmetry. With SYM1≠0, SYM2≠0 implies 2 planes of symmetry in the potential-flow program.

14. Parabolic vorticity option
(IPCV)

If this option is used, input IPCV≠0. Otherwise, the program uses constant vorticity.

15. Boundary-layer calculation option
(BL)

BL=0.0 executes only the potential flow part.
BL=1.0 uses blowing method.
BL=2.0 uses surface displacement method.

16. Extra strip option
(IXFLAG)

IXFLAG=0 no extra strip input.
IXFLAG=1 treats the first input strip as an extra strip.
IXFLAG=3 treats the last input strip as an extra strip.
IXFLAG=2 both the first and last input strips are extra strips.

17. Smoothing option for boundary-layer calculation
(ISM)

Setting ISM=1 will generate 50 boundary-layer stations if the potential-flow input chordwise points were less than 50 on each of the surfaces (upper and lower).

18. Skip the boundary-layer calculation for the nonlifting section
(NØCAL)

Setting NØCAL>0 will bypass the boundary-layer calculation for the nonlifting section. If NØCAL=0, the program assumes that the nonlifting section will have the boundary-layer calculation.

2.5.1 Combination of Vorticity and Kutta Condition Option

There are two options for selecting the Kutta condition as stated before. They are:

Equal pressure Kutta condition	ISAVE
Wake tangency Kutta condition	KUTTA

These two input parameters are mutually exclusive. In other words, when ISAVE=0, KUTTA=1 or ISAVE=1, KUTTA=0. There are also four choices of vortices, namely:

Piecewise linear vorticity option	IWIDTH=1
Step function vorticity option	IWIDTH=0
Parabolic vorticity option	IPCV=1
Constant vorticity option	IPCV=0

If we list a table of these parameters, it can be readily seen that user may have eight choices of how to run his case in the potential flow part of the program. These choices are shown below:

KUTTA	ISAVE	IWIDTH	IPCV
1	0	0	0
0	1	0	0
1	0	1	0
0	1	1	0
1	0	0	1
0	1	0	1
1	0	1	1
0	1	1	1

2.5.2 One Point per Card Input Option

In inputting the body points, the user has the option of punching two points per card or one point per card. These input formats will be explained in the next section. The normal way to input is two points per card. When one point per card is input, the user must punch the characters "ØNE" on the title card from card column 69 to card column 72. For two points per card, this field is left blank.

2.6 Program Restrictions

2.6.1 Input Body Size

The total number of sections input is restricted to 10, with a maximum of 50 strips for the case. The maximum number of basic surface elements (including lifting and nonlifting) that can be formed from the input points is 1000. So if a user desires to use the full capacity of 50 strips, he may only have 20 elements on each, since 20 elements

x 50 strips = 1000 elements. But if he chose to have 60 elements on each strip, then the maximum number of strips he may use is 1000 elements ÷ 60 elements = 16 strips. These size restrictions apply to all cases; lifting, nonlifting and those with both flows.

2.6 [illegible] Points

[illegible]tta condition is applied by a condition of flow tangency in the wake ([illegible] cing KUTTA>0), points and normal vectors must be input. These points are denoted Kutta points. Presently, the program allows a total of 50 Kutta points to be input (i.e., one for each lifting strip). The x,y,z coordinates of the Kutta points and the components of the Kutta point normal vectors are input.

2.6.3 Off-Body Points

When off-body points are input, the value of NØFF must be greater than zero. Inputting the off-body points is quite similar to that of the basic body points. A status flag of 3 indicates the end of the off-body point input. Maximum number of off-body points is 100.

2.6.4 Angles of Attack

User may input a total of 10 angles of attack if he uses only the potential-flow calculation part of the program (by inputting BL = 0.0). If potential-flow and boundary-layer calculations are needed, this program currently allows only one angle of attack to be input.

2.6.5 Nonlifting Section

The order of input to this program should be nonlifting sections first, followed by the lifting sections. User may not run nonlifting sections only in this program, but he may run lifting sections without nonlifting sections. To obtain the zero lift solution, it is necessary to submit the body as a lifting body, then set the input parameters ISAVE=9 and BL=0; this will run the potential flow part alone and give the zero lift answer after the lifting final output.

3.0 INPUT INSTRUCTIONS

Some basic data inputs are necessary for the program while others are optional depending on the user's setup of the control card. Basically, the input consists of three groups. Listed below are these input groups with their associated card types. Each card type will be detailed in the following sections.

3.1 Input Data Groups

3.1.1 Title and Case Execution Information Group

Group	Card Type	Card Type ID	Remarks
1	1	Title	1 card only
1	2	Option control card	1 card only
1	3	Angle of attack cards	at least 1 card
1	4	Moment origin cards	at least 1 card (optional)
1	5	Lifting section information cards	at least 1 card
1	6	Ignored element cards	at least 1 card (optional)
1	7	Lifting strip width cards	at least 1 card (optional)

There are 7 types of cards, but for general use only the 4 non-optional cards are needed.

3.1.2 Body Geometry Data Group

Group	Card Type	Card Type ID	Remarks
2	1	Basic body point input cards	more than 1 card
2	2	Kutta point cards	at least 1 card (optional)
2	3	Kutta normal cards	at least 1 card (optional)
2	4	Off-body point cards	at least 1 card (optional)

These are the 4 types of cards in this group. Usually only Type No. 1 is needed.

3.1.3 Boundary-Layer Program Required Data Group

Group	Card Type	Card Type ID	Remarks
3	1	Boundary-layer card	1 card only
3	2	Transition location cards	at least 2 cards

These two types of cards are both needed. The number of transition location cards = 2 x total number of lifting strips.

3.2 Input Card Sequence — Variables and Formats

The input data card sequence is indicated below first with its variables and formats, then with a more detailed explanation of each variable.

3.2.1 Condensed Form

1. Title card (required)

   Format — (18A4)

   Variable — TITLE

2. Option control card (required)

   Format — (A4, 13I3, 3F4.0, F12.0)

   Variables — CASE, LIFSEC, MØMENT, KUTTA, NØFF, LIST, MPR, IØUT, IG, LASWAK, IATACK, IWIDTH, ISAVE, IPCV, SYM1, SYM2, BL, FC

3. Angle of attack card (required)

   Format — (6E10.0)

   Variables — ALPHAX(I), ALPHAY(I), ALPHAZ(I)
   (I goes from 1 to IATACK)

4. Moment origin card (optional)

   Format — (6E10.0)

   Variables — ØRIGNX, ØRIGNY, ØRIGNZ

5. Lifting section information card (required)

   Format — (16I4)

   Variables — NSØRCE(J), NWAKE(J), NSTRIP(J), IXFLAG(J)
   (J goes from 1 to LIFSEC)

6. Ignored element card (optional)

Format – (16I4)

Variables – IG1(I,J), IGN(I,J) (I goes from 1 to NSTRIP(J))
(J goes from 1 to LIFSEC)

7. Lifting strip width card (optional)

Format – (6E10.0)

Variables – WIDXTR(1,J), WIDTH(I,J), WIDXTR(2,J)
(I goes from 1 to NSTRIP(J)) (J goes from 1 to LIFSEC)

8. Basic body point input cards (required)

Either one of these two formats

Format – (3E10.0, 2I1) [2(3E10.0, 2I1)]

Variables – X,Y,Z, STATUS, LABEL

9. Kutta point cards (optional)

Format – (6E10.0)

Variables – CUTTAX(I), CUTTAY(I), CUTTAZ(I), CUTTAX(I+1), CUTTAY(I+1),
CUTTAZ(I+1), (I goes from 1 to KUTTA)

10. Kutta normal cards (optional)

Format – (6F10.0)

Variables – CNX(I), CNY(I), CNZ(I), CNX(I+1), CNY(I+1), CNZ(I+1)
(I goes from 1 to KUTTA)

11. Off-body point cards (optional)

Format – [2(3E10.0,I1)]

Variables – XØFF(I), YØFF(I), ZØFF(I), STATUS, XØFF(I+1), YØFF(I+1),
ZØFF(I+1), STAT (the last off-body point should have
a status = 3)

12. Boundary-layer run card (required)

Format – (2F15.0, 3I5)

Variables – UI, RI, ISM, IBETA, NØCAL

13. Transition location cards (required)

Format – (I5)

Variable – NTR

3.2.2 Detailed Explanation of the Input Data

1. Title Card — Group 1, Type 1. Required

Card Format — (18A4)

Column	Format	Code	Explanation
1-68	17A4	TITLE	68 character description of the case to be run
69-72	A4	TITLE(18)	If inputting body points one point per card, punch " ØNE", otherwise, leave blank.

2. Option Control Card — Group 1, Type 2. Required

Card Format — (A4, 13I3, 3F4.0, F12.0)

Column	Format	Code	Explanation
1-4	A4	CASE	4 characters used as case ID
5-7	I3	LIFSEC	Total number of lifting sections input
8-10	I3	MØMENT	A nonzero number indicates coordinates of the moment origin will be input.
11-13	I3	KUTTA	Total number of Kutta points to be input. If KUTTA≠0, Kutta points and normals must be input after basic body points and c.c.40 on this card must be zero.
14-16	I3	NØFF	Off-body point input option. A nonzero number indicates there will be off-body points input.
17-19	I3	LIST	Case execution flag. LIST=0 implies full execution. LIST≠0 will have partial execution and terminates after basic geometry is printed.
20-22	I3	MPR	Matrix print flag MPR=0 no matrix print MPR=1 Vij matrix print MPR=2 Aij and sigma solution print MPR=3 onset flow and sigma print
23-25	I3	IØUT	IØUT=0 will print all the geometric quantities associated with each element

Column	Format	Code	Explanation
26-28	I3	IG	Ignored element option. If IG≠0, card type #6 (ignored element card) will be needed.
29-31	I3	LASWAK	A nonzero number means to use the formulas for the special semi-infinite last wake element.
32-34	I3	IATACK	Number of angles of attack to be input.
35-37	I3	IWIDTH	IWIDTH=0, step function option is used, and card type #7 (lifting strip width cards) are not needed. IWIDTH≠0, piece-wide linear option is used, and card type #7 is required.
38-40	I3	ISAVE	ISAVE=0, Kutta points will be used. ISAVE≠0, equal-pressure Kutta condition option is used and no Kutta points are needed. ISAVE=9, will also give zero lift.
41-43	I3	IPCV	IPCV≠0 will select parabolic vorticity option.
44-47	F4.0	SYM1	+1.0 or -1.0 is used for 1 plane of symmetry (negative sign implies anti-symmetric).
48-51	F4.0	SYM2	+1.0 or -1.0 is used for two planes of symmetry with SYM1≠0.
52-55	F4.0	BL	Boundary-layer computation option. BL=0 No boundary-layer calculation, inviscid flow only. BL=1.0 Use boundary-layer calculation, then use blowing method for the final computation. BL=2.0 Use boundary-layer calculation, then use the surface displacement method to compute the final flows.
56-72	F12.0	FC	Foot converter to convert the input coordinates to the units of feet.

3. Angle of Attack Card — Group 1, Type 3. Required

Card Format — (6E10.0)

Column	Format	Code	Explanation
1-10	E10.0	ALPHAX	x-component of the first uniform onset flow.
11-20	E10.0	ALPHAY	y-component of the first uniform onset flow.
21-30	E10.0	ALPHAZ	z-component of the first uniform onset flow.
			For more than 1 uniform onset flow, repeat the same format from c.c. 31-60. Two uniform onset flows (angles of attack) per card. May use as many cards as needed to satisfy IATACK.

4. Moment Origin Cards — Group 1, Type 4. Optional

Card Format — (6E10.0)

Column	Format	Code	Explanation
1-10	E10.0	ØRIGNX	x-coordinate of the moment origin.
11-20	E10.0	ØRIGNY	y-coordinate of the moment origin.
21-30	E10.0	ØRIGNZ	z-coordinate of the moment origin.

5. Lifting Section Information Card — Group 1, Type 5. Required

Card Format — (16I4)

Column	Format	Code	Explanation
1-4	I4	NSØRCE(J)	Number of on-body elements (including ignore-elements) on each lifting strip in the lifting section J.
5-8	I4	NWAKE(J)	Number of wake elements on each lifting strip in the lifting section J.
9-12	I4	NSTRIP(J)	Number of lifting strips (including extra strip) in the lifting section J.
13-16	I4	IXFLAG(J)	Extra strip option. IXFLAG=0 no extra strip input IXFLAG=1 first input lifting strip of section J is an extra strip IXFLAG=3 last input lifting strip of section J is an extra strip IXFLAG=2 implies both first and last strips of a lifting section J are extra strips

Column	Format	Code	Explanation
			Repeat the above format again from c.c. 17 to 64. Four sections per card. Subscript J goes from 1 to the total number of lifting sections (LIFSEC).

6. Ignored Element Card – Group 1, Type 6. Optional

Card Format – (16I4)

Column	Format	Code	Explanation
1-4	I4	IG1(I,J)	Punch a number K – it means the Kth element in a lifting strip that is used as the beginning of the ignored element group.
5-8	I4	IGN(I,J)	Punch a number M – it means the Mth element in a lifting strip that the ignored element group ends. For example, assume a lifting strip has 10 source elements, and the 3rd, 4th, 5th elements are the ignored elements. In this case, IG1=3, IGN=5. I = strip indix, J = section index. Repeat the same format on the same card for the next strip. 7 strips of ignored elements per card. Start a new card for a new lifting section.

7. Lifting Strip Width Card – Group 1, Type 7. Optional

Card Format – (6E10.0)

Column	Format	Code	Explanation
1-10	E10.0	WIDXTR(1,J)	Width for the first extra strip of a lifting section. Leave blank if there is no first extra strip.
11-20	E10.0	WIDTH(I,J)	Width value for the first lifting strip. Repeat the same format for successive strips until all lifting strip widths are punched. If there are more than 6 values, use another card. I = strip index, J = section index.
21-30	E10.0	WIDXTR(2,J)	The last width value is the last extra strip width. If no last extra strip, leave this field blank. Start a new card for a new lifting section.

8. Basic Body Point Input Cards — Group 2, Type 1. Required

Card Format — [2(3E10.0,2I1)] if TITLE(18) is blank.

Card Format — (3E10.0,2I1) if TITLE(18) is " ØNE".

Column	Format	Code	Explanation
1-10	E10.0	X	x,y,z coordinates of a point on the line to be read in to form an element
11-20	E10.0	Y	
21-30	E10.0	Z	
31	I1	STATUS	STATUS=2 new section STATUS=1 new line STATUS=0 same line STATUS=3 end of all body point input
32	I1	LABEL	LABEL=1 lifting section LABEL=0 nonlifting section
33-42	E10.0	XX	x,y,z coordinates of the next point. Use only if 2 points per card option was selected. Status & label have same meanings as above.
43-52	E10.0	YY	
53-62	E10.0	ZZ	
63	I1	STATUS	
64	I1	LABEL	

9. Kutta Point Cards — Group 2, Type 2. Optional.

Card Format — (6E10.0)

Column	Format	Code	Explanation
1-10	E10.0	CUTTAX(I)	x,y,z coordinates of the Kutta point controls
11-20	E10.0	CUTTAY(I)	
21-30	E10.0	CUTTAZ(I)	
31-40	E10.0	CUTTAX(I+1)	x,y,z coordinates of the next Kutta points
41-50	E10.0	CUTTAY(I+1)	
51-60	E10.0	CUTTAZ(I+1)	

Two Kutta points per card. Repeat same card until all Kutta points are input.

10. Kutta Normal Cards — Group 2, Type 3. Optional.

Card Format — (6E10.0)

Column	Format	Code	Explanation
1-10	E10.0	CNX(I)	x,y,z components of the Kutta point normal vector
11-20	E10.0	CNY(I)	
21-30	E10.0	CNZ(I)	

Column	Format	Code	Explanation
31-40 41-50 51-60	E10.0 E10.0 E10.0	CNX(I+1) CNY(I+1) CNZ(I+1)	x,y,z components of the next Kutta point normal vector
			Repeat the same format for the next card if needed, until all Kutta point normals are input.

11. Off-Body Point Cards — Group 2, Type 4. Optional.

Card Format — [2(3E10.0,I1)]

Column	Format	Code	Explanation
1-10 11-20 21-30	E10.0 E10.0 E10.0	XØFF(I) YØFF(I) ZØFF(I)	x,y,z components of the input off-body point
31	I1	STATUS	Punch 3 for the last off-body point, otherwise leave blank
32-41 42-51 52-61	E10.0 E10.0 E10.0	XØFF(I+1) YØFF(I+1) ZØFF(I+1)	Same meaning as above
62	I1		
			Repeat the format of this card as many time as needed for all the off-body points. The last card must have a 3 punched in either column 31 or 62 depending on where the point ends.

12. Boundary Layer Run Card — Group 3, Type 1. Required.

Card Format — (2F15.0,3I5)

Column	Format	Code	Explanation
1-15	F15.0	UI	Reference velocity, (ft/sec)
16-30	F15.0	RI	Reynold's number, (ft^{-1})
31-35	I5	ISM	ISM≠0 will generate more boundary-layer calculation stations from the potential-flow output stations.
36-40	I5	IBETA	IBETA≠0 uses alternate way to compute β. Usually this flag should be set to 0.
41-45	I5	NØCAL	NØCAL≠0 will suppress the boundary-layer calculation for the nonlifting section.

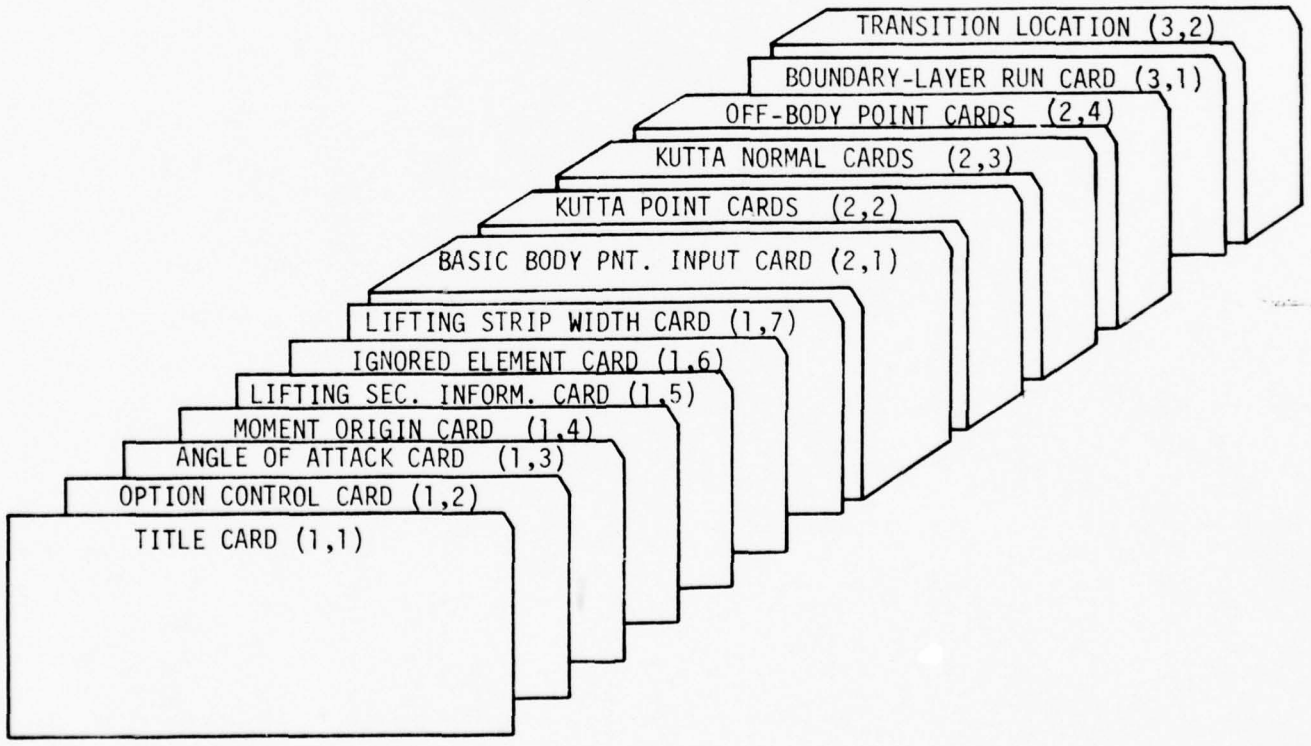
13. Transition Location Card — Group 3, Type 2. Required.

Card Format — (I5)

Column	Format	Code	Explanation
1-5	I5	NTR	Transition location of the input boundary layer strip. If this value is unknown, user may punch a large value and the program will calculate the transition location. Two transition location cards per lifting strip, one for the lower surface and one for the upper surface, are input in that order. The number of transition location cards needed = 2 x the total number of lifting strips.

3.3 Input Card Deck Setup

The following illustration shows the arrangement of the input data cards.



First index on the upper right corner indicates the Group Number, second one is the Card Type Number.

4.0 INPUT LOAD SHEETS

The following input data sheets are designed to assist users loading their data to be key punched. The Group No., Card Type No., and Sequence No. are put in for reference only and the user need not fill them in.

GROUP 1 – TYPE 1 TITLE CARD (REQUIRED)

TITLE			GROUP	TYPE
(18A4)			01	01

THE FOLLOWING TITLE CARD FORMAT IS USED WHEN THE BASIC BODY POINTS ARE INPUT 1 POINT PER CARD

(17A4)	ØNE		01	01
	ØNE			

GROUP 1 – TYPE 2 OPTION CONTROL CARD (REQUIRED)

CASE	LIFSEC	MØMENT	KUTTA	NØFF	LIST	MPR	IØUT	IG	LASWAK	IATACK	IWIDTH	ISAVE	IPCV	SYM1	SYM2	BL	FC		GROUP	TYPE
(A4, 13I3, 3F4.0, F12.0)																			01	02

GROUP 1 — TYPE 3 ANGLE OF ATTACK CARD (REQUIRED)

ALPHAX(I)	ALPHAY(I)	ALPHAZ(I)	ALPHAX(I+1)	ALPHAY(I+1)	ALPHAZ(I+1)		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76	77 78	79 80
(6E10.0)							0 1	0 3

THE ABOVE FORMAT IS REPEATED UNTIL THE INDEX I = IATACK AS INPUT IN GROUP 1 TYPE 2.

GROUP 1 — TYPE 4 MOMENT ORIGIN CARD (OPTIONAL)

ØRIGNX	ØRIGNY	ØRIGNZ		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76	77 78	79 80
(6E10.0)				0 1	0 4

GROUP 1 – TYPE 5 LIFTING INFORMATION CARD (REQUIRED)

NSORCE (J)	NWAKE (J)	NSTRIP (J)	IXFLAG (J)	NSORCE (J+1)	NWAKE (J+1)	NSTRIP (J+1)	IXFLAG (J+1)	NSORCE (J+2)	NWAKE (J+2)	NSTRIP (J+2)	IXFLAG (J+2)	NSORCE (J+3)	NWAKE (J+3)	NSTRIP (J+3)	IXFLAG (J+3)		GROUP	TYPE
1 2 3 4	5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20	21 22 23 24	25 26 27 28	29 30 31 32	33 34 35 36	37 38 39 40	41 42 43 44	45 46 47 48	49 50 51 52	53 54 55 56	57 58 59 60	61 62 63 64	65 66 67 68 69 70 71 72 73 74 75 76	77 78	79 80
(16I4)																	01	05

THE ABOVE FORMAT IS REPEATED UNTIL THE INDEX J = LIFSEC AS INPUT IN GROUP 1 TYPE 2.

GROUP 1 – TYPE 6 IGNORED ELEMENT CARD (OPTIONAL)

IG1 (I,J)	IGN (I,J)	IG1 (I+1,J)	IGN (I+1,J)	IG1 (I+2,J)	IGN (I+2,J)	IG1	IGN	IG1	IGN	IG1	IGN	IG1	IGN	IG1	IGN	IG1	IGN		GROUP	TYPE
1 2 3 4	5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20	21 22 23 24	25 26 27 28	29 30 31 32	33 34 35 36	37 38 39 40	41 42 43 44	45 46 47 48	49 50 51 52	53 54 55 56	57 58 59 60	61 62 63 64	65 66 67 68	69 70 71 72	73 74 75 76	77 78	79 80
(16I4)																			01	06

I IS THE LIFTING STRIP INDEX OF A LIFTING SECTION J. 7 STRIP ON EACH CARD. START A NEW CARD FOR ANOTHER LIFTING SECTION AND REPEAT THE SAME FORMAT AGAIN.

GROUP 1 — TYPE 7 LIFTING STRIP WIDTH CARD (OPTIONAL)

WIDXTR (1,J)	WIDTH (I,J)	WIDTH (I+1,J)	WIDTH (I+2,J)	WIDTH (I+3,J)	WIDXTR* (2,J)		GROUP	TYPE
			(6E10.0)				0	7

I IS THE LIFTING STRIP INDEX. J IS THE LIFTING SECTION INDEX.
START A NEW CARD WITH A NEW LIFTING SECTION AND REPEAT THE SAME FORMAT.
*THIS FIELD FOLLOWS AFTER ALL LIFTING STRIPS OF A SECTION IS INPUT. IF THERE IS NO LAST EXTRA STRIP, PUNCH 0.0.

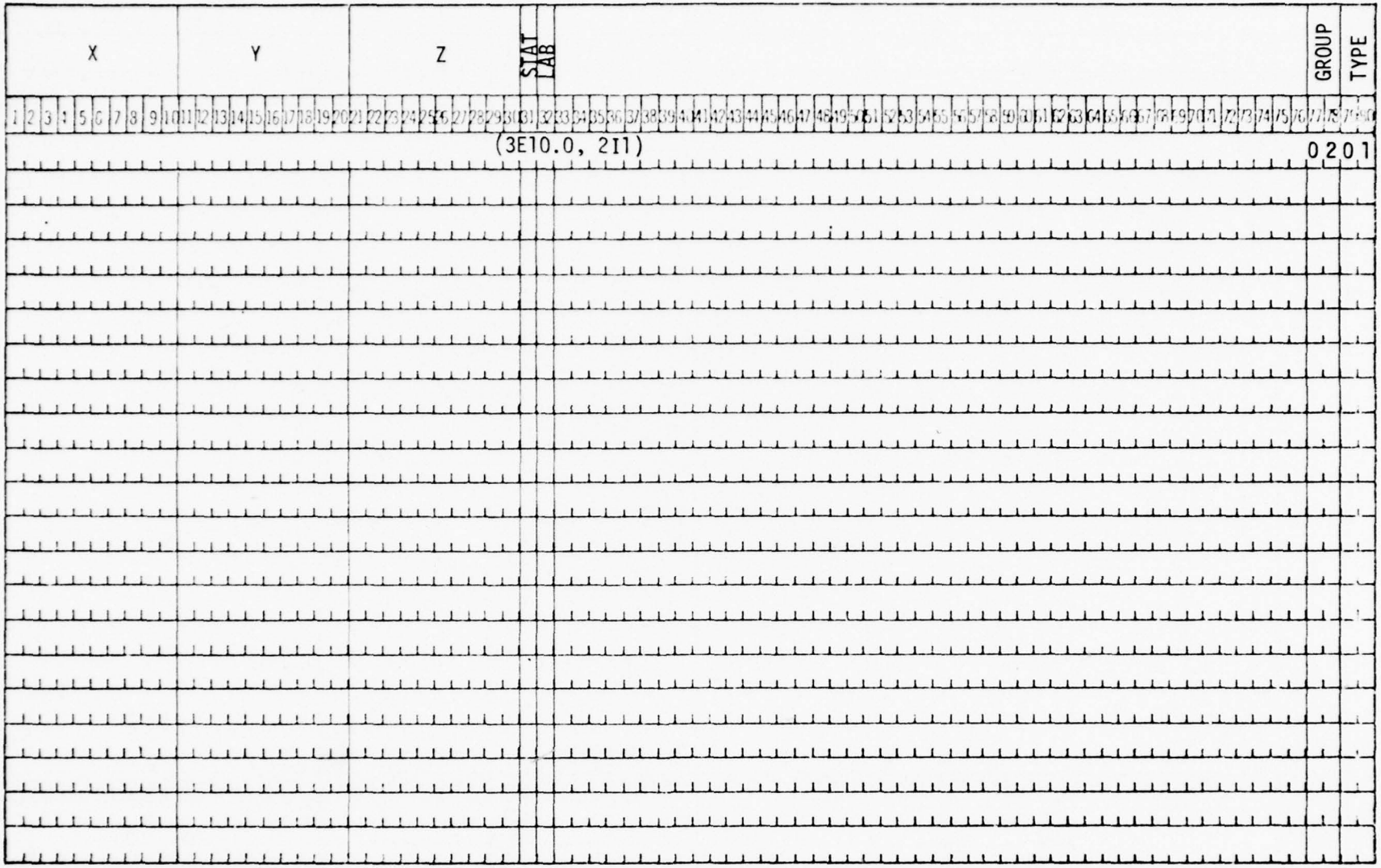
GROUP 2 — TYPE 1 BASIC BODY POINT INPUT CARD (REQUIRED) 2 POINT PER CARD FORMAT

X	Y	Z	STAT	LAB	XX	YY	ZZ	STATT	LABL		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31	32	33 34 35 36 37 38 39 40 41 42	43 44 45 46 47 48 49 50 51 52	53 54 55 56 57 58 59 60 61 62	63	64	65 66 67 68 69 70 71 72 73 74 75 76	77 78	79 80
(2(3E10.0, 2I1))											0 2	0 1

STAT (OR STATT) = 2 NEW SECTION
= 1 NEW N-LINE
= 0 SAME N-LINE
= 3 END OF ALL INPUT

LAB (OR LABL) = 0 NONLIFTING SECTION
= 1 LIFTING SECTION

GROUP 2 — TYPE 1 BASIC BODY POINT INPUT CARD (REQUIRED) 1 POINT PER CARD FORMAT



STAT = 2 NEW SECTION
= 1 NEW N-LINE
= 0 SAME N-LINE
= 3 END OF ALL INPUT

LAB = 0 NONLIFTING SECTION
= 1 LIFTING SECTION

GROUP 2 — TYPE 2 KUTTA POINT CARD (OPTIONAL)

CUTTAX(I)	CUTTAY(I)	CUTTAZ(I)	CUTTAX(I+1)	CUTTAY(I+1)	CUTTAZ(I+1)		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76	77 78	79 80
(6E10.0)							0 2	0 2

REPEAT THE SAME FORMAT UNTIL I = KUTTA AS INPUT IN GROUP 1 TYPE 2

GROUP 2 — TYPE 3 KUTTA NORMAL CARD (OPTIONAL)

CNX(I)	CNY(I)	CNZ(I)	CNX(I+1)	CNY(I+1)	CNZ(I+1)		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69 70	71 72	73 74
(6E10.0)							02	03

REPEAT THE SAME FORMAT UNTIL I = KUTTA AS INPUT IN GROUP 1 TYPE 2

GROUP 2 — TYPE 4 OFF-BODY POINT CARD (OPTIONAL)

XØFF	YØFF	ZØFF	STAT	XØFF	YØFF	ZØFF	STAT		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 28 29 30	31	32 33 34 35 36 37 38 39 40 41	42 43 44 45 46 47 48 49 50 51	52 53 54 55 56 57 58 59 60 61	62	63 64 65 66 67 68 69 70 71 72 73 74 75	76 77	78 79 80
(2(3E10.0, I1))									02	04

STAT (OR STATT) = 0 NOT THE LAST OFF-BODY POINT
= 3 END OF ALL OFF-BODY POINT INPUT

GROUP 3 — TYPE 1 BOUNDARY LAYER CARD (REQUIRED)

UI	RI	ISM	IBETA	NØCAL		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	31 32 33 34 35	36 37 38 39 40	41 42 43 44 45	46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75	76 77	78 79 80
(2F15.0, 3I5)						03	01

IBETA = 0 IS NORMALLY USED.

GROUP 3 — TYPE 2 TRANSITION LOCATION CARD (REQUIRED)

NTR		GROUP	TYPE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75	76 77	78 79 80
(I5)		03	02

THE ABOVE 2 TYPES OF CARDS ARE NOT NEEDED IF ONLY THE POTENTIAL FLOW CALCULATION IS SELECTED.

5.0 OUTPUT EXPLANATION

The output of each case is composed of four parts. Part one is the initial potential flow run. Part two is the output from the simulation program. Part three has all of the boundary-layer-calculation output. Finally, part four is the final output of the potential-flow calculations.

In addition to the above normal output, there are some optional intermediate outputs, which will be explained after the normal output.

5.1 Results of the Initial Potential-Flow Calculations

5.1.1 Basic Data

Symbol	Definition
N	An integer index to identify the strip number of the section.
M	An integer index to identify the element number of the strip.
X	x-coordinate of the element's corner point.
Y	y-coordinate of the element's corner point.
Z	z-coordinate of the element's corner point.
NX	x-component of the unit normal vector.
NY	y-component of the unit normal vector.
NZ	z-component of the unit normal vector.
XO	x-coordinate of the centroid of the element.
YO	y-coordinate of the centroid of the element.
ZO	z-coordinate of the centroid of the element.
D	The distance the four corner points are projected to become coplanar.
T	Maximum diagonal length of the projected element.
A	Area of the element.
NLIF	Nonlifting section element.
LIFT	Lifting section element.
XTRA	Extra strip element.

Symbol	Definition
WAKE	Wake element.

Note: This will be the only output if "LIST" is input with a nonzero value on card #2.

5.1.2 On-Body Solutions

Symbol	Definition
N	An integer index to identify the strip number of the section.
M	An integer index to identify the element number on the strip.
XO	x-coordinate of the centroid of the element.
YO	y-coordinate of the centroid of the element.
ZO	z-coordinate of the centroid of the element.
VX	x-component of the total flow velocity.
VY	y-component of the total flow velocity.
VZ	z-component of the total flow velocity.
VT	Magnitude of the total velocity.
VTSQ	Magnitude of the total velocity squared.
CP	Pressure coefficient, equals 1 − VTSQ.
DCX	x-component of the direction cosine of the velocity vector.
DCY	y-component of the direction cosine of the velocity vector.
DCZ	z-component of the direction cosine of the velocity vector.
NX	x-component of the unit normal vector.
NY	y-component of the unit normal vector.
NZ	z-component of the unit normal vector.
SIG	Surface source density.
VN	Dot product of the velocity and the unit normal.
AREA	Area of the element.

Note: 1. The components listed for the forces and the moments are in the x,y,z order.

2. If there are ignored elements input, the solutions for the ignored elements will not be printed. The output of the on-body solutions in this case will show less elements than other strips which do not contain the ignored elements.

5.1.3 Kutta Point Solutions

Symbol	Definition
KUTTA POINTS	Identifies the Kutta point number.
XO	x-coordinate of the Kutta point.
YO	y-coordinate of the Kutta point.
ZO	z-coordinate of the Kutta point.
VX	x-component of the total velocity.
VY	y-component of the total velocity.
VZ	z-component of the total velocity.
VT	Magnitude of the total velocity.
VN	Dot product of the velocity and the unit normal.
CP	Pressure coefficient.
DCX	x-component of the direction cosine of the velocity vector.
DCY	y-component of the direction cosine of the velocity vector.
DCZ	z-component of the direction cosine of the velocity vector.
NX	x-component of the Kutta normal vector.
NY	y-component of the Kutta normal vector.
NZ	z-component of the Kutta normal vector.

5.1.4 Off-Body Point Solutions

Symbol	Definition
PØINTS	Identifies the off-body point number.
XO	x-coordinate of the off-body point.

Symbol	Definition
YO	y-coordinate of the off-body point
ZO	z-coordinate of the off-body point
VX	x-component of the total velocity
VY	y-component of the total velocity
VZ	z-component of the total velocity
VT	Magnitude of the total velocity
VTSQ	Magnitude of the total velocity squared
CP	Pressure coefficient
DCX	x-component of the direction cosine
DCY	y-component of the direction cosine
DCZ	z-component of the direction cosine

5.1.5 Bound Vorticity Coefficient Solution

Symbol	Definition
STRIP NØ.	Identifies the order of the strips in the lifting section
B(STRIP)	The bound vorticity coefficient (chordwise dipole derivative) associated with each strip.

5.1.6 Intermediate Print

This section explains the various messages, notes and quantities that are printed, other than the final output explained before.

1. Control Flags Print

   This is the first page printout of all the input control flags and all the uniform onset flows. This part of the output enables user to check if the control variables are input properly.

2. Time Print at Various Steps During Execution

   When the computer run starts, time is initialized to zero. At various parts of the program during execution of the run, current CPU time is called and printed. Subtraction of the time between steps will indicate the amount of CPU time used.

BEGIN THE SUBRØUTINE INPUT. TIME IS xxx.xxx SEC.

Note: The time at the beginning of the input routine.

BEGIN THE FØRMATIØN ØF ELEMENTS. TIME IS xxx.xxx SEC.

Note: The time at the start of element formation.

FINISH THE FØRMATIØN ØF ELEMENTS. TIME IS xxx.xxx SEC.

Note: The time at the completion of element formation including the printout of the basic data.
Subtraction of the previous step time from this time should give the time it takes to form the body elements.

END ØF SUBRØUTINE INPUT. TIME IS xxx.xxx SEC.

Note: The time at the end of the input routine.

BEGINNING THE VFØRM RØUTINE. TIME IS xxx.xxx SEC.

Note: The time at the beginning of the velocity formation routine.

TIME FØR THE FØRMATIØN ØF THE $\begin{matrix}\text{LIFTING}\\ \text{NØNLIFTING}\end{matrix}$ VELØCITY MATRIX = xx.xx MIN.

Note: This is the time required for forming either the nonlifting or lifting velocity matrix in minutes.

END ØF THE VFØRM RØUTINE. TIME IS xxx.xx SEC.

Note: This is the time at which the formation of the velocity matrix for the whole body is completed.

END ØF THE AFØRM RØUTINE. TIME IS xxx.xx SEC.

Note: This is the time at which the formation of the Aij matrix is completed.

THE N X N MATRIX WITH m RIGHT SIDES WAS SØLVED DIRECTLY IN xx.xxx MIN.

Note: This gives the total time the matrix solution routine requires.

3. Source Velocity Matrix Print

CØLUMN
CNTRL PT
VXS
VYS
VZS

Explanation: The numbers printed below these headers are the source velocity matrix column number, the control point number, the x,y and z components of the source velocity matrix.

Note: This printout will only appear when MPR=1 is input.

4. Dipole Velocity Matrix Print

   STRIP
   CØNTRØL PT
   VXF, VXS
   VYF, VYS
   VZF, VZS

Explanation: The numbers printed below these headers are the strip count (lifting), control point number, the x,y,z components of the first and second dipole velocity.

Note: This printout will appear only if MPR is set equal to 2.

5. Onset Flow Matrix Print

   ØNSET FLØW NØ
   CØNTRØL PØINTS
   X-FLØW
   Y-FLØW
   Z-FLØW

Explanation: The numbers printed below these headers are the onset flow number, the control point number, and the x,y,z components of the onset flows.

Note: This printout will appear only if MPR=2 is input.

6. The Dot Product (Aij) Matrix Print

   CØLUMN
   AIJ
   FLØW NØ.
   RIJ

Explanation: Under these headers are the column count of the AIJ matrix, the dot product value, the onset flow numbers and the righthand side matrix.

Note: This printout will appear if MPR is set greater than or equal to 2.

7. The Sigma Matrix Print

SØLUTIØN ØBTAINED AFTER CØLSØL

FLØW NØ. — Indicates the onset flow number. Following it are the sigma solutions. 8 numbers to a line.

Note: This matrix will be printed if MPR is not less than 2.

8. Other Intermediate Print

TABLE ØF INPUT INFØRMATIØN

INPUT SECTIØN NØ. — Section number count

SECTIØN TYPE — Type of input section

0 nonlifting

1 lifting

TØTAL NØ. ØF ELEMENT IN EACH SECTIØN

Summarize the total element count (including wake element less extra strip)

EXTRA STRIPS — 0 no extra strip

1 first strip is extra

3 last strip is extra

2 both first and last strip are extra strips

STRIP NØ. — Indicates the strip count

SØURCE ELEMENTS IN THE STRIP — Prints number of on-body elements in each strip (including ignored elements).

WAKE ELEMENTS IN THE STRIP — Indicates the wake elements in the strip.

TØTAL NØ. ØF ELEMENTS INPUT — Sums up all the elements input (not counting the extra strip elements).

BØDY SECTIØN NØ. = n — Indicates that the velocity formation is being processed for the input section n.

TYPE = i — Indicates this section n is of the type i(i = 0 for nonlifting, i = 1 for lifting).

TØTAL NØ. ØF PØINTS = mm — Indicates the total elements in the section n.

NØ. ØF STRIPS = j — Indicates the total number of strips in the section.

TØTAL NØ. ØF CØNTRØL PØINTS (INCL. ØFF-BØDY PØINTS) = nn — Indicates the total number of control points in the section.

LIFTING STRIP NØ. j, NØ. ØF IGNØRE ELEMENTS k — Indicates the lifting strip count and its number of ignored elements.

TØTAL NØ. ØF ELEMENTS IN THE LIFTING SECTIØN — Indicates the total number of lifting elements in the lifting section.

NØ. ØF FAR ELEMENTS = xx — Far field element count.

NØ. ØF INTERMEDIATE ELEMENTS = xx — Intermediate field element count.

NØ. ØF NEAR FIELD ELEMENTS = xx — Near field element count.

9. Identifying the final output for certain uniform onset flow

FINAL ØUTPUT FØR THE FØLLØWING UNIFØRM ØNSET FLØW

($\pm$x.xxxxxx, $\pm$x.xxxxxx, $\pm$x.xxxxxx)

These are the components of the input uniform onset flow.

10. Identifying the zero-lift output for certain uniform onset flow.

ZERØ LIFT ØUTPUT FØR THE FØLLØWING UNIFØRM ØNSET FLØW

($\pm$x.xxxxxx, $\pm$x.xxxxxx, $\pm$x.xxxxxx)

These are the components of the uniform onset flow from which the zero lift is calculated.

5.2 The Simulation Program

There are two different types of simulation program output: one is for blowing method, and the other is the result of the surface displacement method. Either type of output is printed depending upon user's choice.

5.2.1 Before Boundary-Layer Program

This part of the output is the same for both blowing and surface displacement methods.

Symbol	Definition
SECTIØN NØ.	Section number of the input body
TYPE	Nonlifting section is type 0. Lifting section is of type 1.
TØTAL STRIPS	Total number of strips within the section.
STRIP NØ.	Strip number of the printed section
STAGNATIØN PØINT	Element number of the strip where stagnation point is calculated

Symbol	Definition
XO YO ZO	The x,y,z coordinates of the computed stagnation point.
BL. STRIP	Boundary-layer strip number. A value of 1 denotes it is the lower surface of the original strip used in the potential flow calculation, while a value of 2 is for the upper surface.
C. PØINT	Original potential-flow calculation control point numbers, except number one which is the computed stagnation point.
X Y Z	The x,y,z components of the control point.
V	Surface velocity at the control point.
S	Arc length between consecutive control points.
K	Boundary-layer station numbers if smoothing option is chosen.
PCHØRD	The percent chord associated with the smoothing stations. Note: This is a prescribed array in the program.
XK(K) ZK(K)	The interpolated x,z values at the smoothed boundary-layer stations.
S(K)	The interpolated arc lengths between successive stations.
V(K)	The interpolated surface velocities.

5.2.2 After Boundary-Layer Program

Symbol	Definition
I	Potential-flow calculation station number
SM(I)	Back interpolated arc length values from the smoothed boundary-layer stations.
VB(I)	Back interpolated surface velocities from the smoothed boundary-layer stations.
DEL(I)	Back interpolated δ^* values from the smoothed boundary-layer stations.

5.2.3 Surface Blowing Simulation Output

1. THE NEW RIGHT-HAND SIDE

   These are the generated blowing normal velocities to be used in solving for the final potential-flow solution. These velocities for each strip are printed after the strip has finished its boundary-layer calculation, and, finally, a whole set of blowing normal velocities is printed before the matrix solution routine is called. This set of blowing normal velocities will be the right-side column matrix [C] in the matrix equation $[A]\,[C]^{-1} = [B]$, where

   [A] is the [Aij] matrix from the initial potential-flow calculation,

   [B] is the source density column matrix to be solved.

2. SØLUTIØN ØBTAINED AFTER CØLSØL
   FLØW NØ. 1

   This is the solution matrix [B] (the source density matrix) obtained after the matrix solution routine is called.

3. CHECKING THE SIGMAS AFTER B. LAYER LINK
   SIGMAS ØF THE UNIFØRM FLØW NØ. 1

   First the original σ solution of the uniform flow is printed. This enables the user to check the same uniform flow solution (from initial potential-flow calculations) as brought back. Then the second part with the same message printout is the uniform flow σ solution plus the solution obtained from 2. It is the final σ result to be used in computing the final flow.

4. B-ARRAY

   The new bound vorticity coefficient associated with each strip.

5. Boundary-layer calculation summaries for each lifting strip.

   A table, which consists of the input to the boundary-layer program and the output δ^*'s for each lifting strip, is provided. Explanations of these parameters are given below.

Symbol	Definition
STRIP NØ.	Lifting strip number.
C.PØINT	Control point number in the strip
X Z	x,z coordinates of the control point
V	Surface velocity at the control point
S	Arc length between two control points
DEL	Displacement thickness δ^* at control points
DQDS	$\partial q/\partial S$ computed for each control point, where $q = \delta^* V$. When $\partial q/\partial S$ over the entire body is computed, it is used as a new right-hand side in the original matrix equation to be solved for density distribution.

5.2.4 Surface Displacement Simulation Output

After both the lower and upper surfaces are computed in the boundary-layer program, a summary of the input and output variables are printed in one table. The following list shows the symbols and their definitions.

Symbol	Definition
STRIP NØ.	Lifting strip number
C.PØINT	Control point number in the strip
X Z	x,z coordinates of the control point
V	Surface velocity at the control point
S	Arc length between two control points
DEL	Displacement thickness δ^* at control points

Another output is a table of δ^*. This output is solely for the purpose of checking the δ^*'s on the external unit before they are used in generating new coordinates.

Symbol	Definition
DEL STAR	Displacement thickness δ^*
K	A do-loop counter counting the number of strips
K1	A counter that was stored on the tape to identify the tape number. K1 should always be equal to K.

5.3 Boundary-Layer Program Output

The output of this program consists of three parts: The input body geometry data, the computed station data, and the output summary at each station.

Listed below are the output variables and their definitions in the order of their appearances in the output.

Symbol	Definition
TRFLAG	Transition location flag. The value of this flag is set equal to 1. The program will calculate the transition location if the user inputs a number larger than the number of boundary-layer calculation stations for the value of NTR.
TRINT	Transition control flag. This flag is set equal to zero which means the transition is instantaneous.
TVC	= 0, not applicable
SHØRTP	Print control flag. This flag is set equal to 1 in the program. This means the program will use short printout (no velocity or enthalpy profiles printed).
X/C	Nondimensionalized x-coordinates.
Y/C	Nondimensionalized y-coordinates (it is actually the z-values from potential-flow program)
X	x-coordinate in feet
S	Surface distance in feet
S/C	Nondimensionalized surface distance
H1	First increment of η calculation
C	Chord length in feet
PRO	Laminar Prandtl number
K	Variable grid factor. It is set equal to 1.14.
RHØREF	Freestream reference density, slugs/ft^3
SWEEP	Sweep angle. Not used in this version.
KK	Flow index KK = 0.0 for 2-D flows
MUREF	Freestream dynamic viscosity μ_∞, lb_f sec/ft^2

Symbol	Definition
HE	Total enthalpy at the edge of boundary layer, $(ft/sec)^2$.
EPS1	Converge criteria for laminar flow. Set equal to 0.005.
VREF	Reference velocity, ft/sec.
TREF	Reference temperature T_∞, °R.
REY	Reynolds number based on reference conditions.
MREF	Freestream Mach number.
RØ/C	It is the z values from the potential-flow program.
TW	Not applicable here.
UE	u_e, velocity at edge of boundary layer, ft/sec.
PE	Pe, pressure at edge of boundary layer, lb_f/ft^2.
FW	f_w, the transformed stream function at the wall $$f_w = -\frac{1}{(2\xi)^{1/2}} \int_0^\xi \frac{\rho_w v_w}{p_e \mu_e u_e} d\xi$$
ALPHA1 QW	Not applicable to this version
CP	Pressure coefficient
MUE	Local dynamic viscosity μ_e, at edge of boundary layer $lb_f \cdot sec/ft^2$
FPW	f'_w
BETA	$\beta = (2\xi/u_e)(du_e/d\xi)$
ALPHA2 RR ME TE	Not applicable in this version
SQUIG	Transformed x-coordinate ξ $$\xi = \int_0^x \rho_e \mu_e u_e \, dx$$
THETA	Momentum thickness, θ, ft

Symbol	Definition
DELS	Boundary-layer displacement thickness $\delta^* = \int_0^\infty 1 - \frac{\rho u}{\rho_e u_e} \, dy$, ft
CF	Value of the local skin friction coefficient, c_f $c_f = \tau_w/(1/2\rho_e u_e^2)$
FPPW	f''_w
GW	Total enthalpy ratio H_w/H_e
IMAX	Number of points taken through the boundary layer.
RX	Reynold's number based on x
RTHETA	Momentum thickness Reynolds number, R_θ
H	Boundary-layer shape factor, $H = \delta^*/\theta$
CFA	Integrated skin-friction coefficient, C_F
GPW	g'_w, slope of g_w as a function of η at the wall
ST	Stanton number, not used in this version
ETAINF	η_∞

5.4 Final Output

The final output format of the program is identical to the initial potential-flow calculation output. When the blowing method is used the original coordinates will be output again with the new potential flow solution. For the surface displacement method, the new body coordinates are printed with the final potential-flow solution.

6.0 ERROR MESSAGES

6.1 Inviscid Flow Program

a. Message: MISMATCH ØF ELEMENTS IN A LIFTING STRIP IS DETECTED. ELEMENTS FØRM = xxx, ELEMENTS INPUT = xxx, CØMPUTATION TERMINATED.

Cause of error: Inconsistent input data. The program sums up the number of on-body elements plus the wake elements. This sum does not match that of the input elements formed from the input coordinates.

Action: Check the lifting body information card and the input basic body points coordinate cards.
Number of points input should equal the number of elements plus 1 on each strip.

For example. If in a lifting section, each lifting strip consists of 10 on-body elements and 1 wake element, the total element number is 11, and there should be 12 points input. Each point has x,y,z coordinates.

b. Message: ERRØR IN IGNØRED ELEMENT CØUNT xxx, SHØULD BE xxx.

Cause of error: Erroneous input of the ignored element information.

Action: Check the input data on group 1, type 6 cards. Make sure the ignored element information is properly input.

c. Message: LABEL ERRØR IN NØNLIFTING VFØRM.

Cause of error: Reading in wrong part of data from unit 4. The geometric quantities of each element are stored in unit #4. These data must be read in during the velocity formation routine. In front of these geometric quantities is a label which indicates they are lifting section data or nonlifting data. If computation is in the nonlifting section and the system is reading in lifting section data, the above message will be displayed.

Action: Check that the number of lifting strips input is the actual number of strips input.

d. Message: ERROR IN VFØRM. THE ELEMENTS FØRMED DØ NØT CØRRESPØND TØ THE NØ. ØF BØDY ELEMENTS.

Cause of error: The input number of elements does not correspond to the actual number of elements being formed.

Action: Check lifting body information input, and also the non-lifting body points, if any.

e. Message: AFTER xxx ITERATIØNS, DELTA B STILL DID NØT CØNVERGE TØ THE GIVEN CRITERIØN/LARGEST DELTA B = ± x.xxxxxxE±xx/ PRØGRAM PRØCEEDS WITH THE MØST CURRENT VØRTEX STRENGTH.

Cause of error: In the stepwise routine, after 100 iterations, the ΔB value is still bigger than the given criterion, so the max. B value is used for further calculation. (B = Bound vorticity coefficient.)

Action: Check the basic body coordinate input.

f. Message: XXX ØNBØDY PØINTS MISSED, EXECUTIØN TERMINATED.

Cause of error: In the final output, the on-body element count is incorrect.

Action: Check the number of source elements input.

g. Message: XXX KUTTA PØINTS MISSED, EXECUTIØN TERMINATED.

Cause of error: In the final output, the Kutta point count is incorrect.

Action: Check the total number of Kutta points input.

h. Message: XXX ØFF-BØDY PØINTS MISSED, EXECUTIØN TERMINATED.

Cause of error: In the final output, the off-body point count is incorrect.

Action: Check the number of off-body points input.

i. Message: THE MATRIX OF XXXXX ELEMENTS EXCEEDS xxxxxx.

Cause of error: The size of the matrix is too big for the work area prepared for the CØLSØL routine.

Action: Change ISIZE in the main program.

6.2 Boundary-Layer Program

a. Message: ***ITERATIØNS EXCEED THE ALLØWABLE LIMIT***

Cause of error: In subroutine BØUNDL, if the number of iterations exceeds 9, this message will be printed and job stops.

Action: None.

b. Message: NEGATIVE VELØCITY IS FØUND, ITERATIØN ENDS

Cause of error: During iteration at a given station, a negative velocity is found, and run stops. This error message is printed in subroutine BØUNDL.

Action: None.

c. Message: **ERRØR — NØ INPUT FØR EITHER VREF ØR MREF

Cause of error: Both the reference velocity UI and the reference freestream Mach number are missing from the input.

Action: Check the input of VREF, make sure it is a nonzero number.

d. Message: **ERRØR — XI AT STATIØN 1 NE ØR GT 0.

Cause of error: The first point of the surface distance must be equal to 0.

Action: Check the input S array. If $S(1) \neq 0$. Change it and rerun the job.

e. Message: **ERRØR — FP PRØFILE IS NEGATIVE AT I = xxx

Cause of error: At the printed station number, the f' profile is found to be negative.

Action: None.

f. Message: **ERRØR – IMAX(xxx) EXCEEDS 100 – IMAX = xxx.

Cause of error: The number of iteration at the printed station number exceeds 100.

Action: None.

g. Message: **********CASE TERMINATED**********

Cause of error: Any occurrence of the error messages in the boundary-layer program.

6.3 Simulation Programs

a. Message: NØ SEPARATIØN CAN BE FØUND FØR THIS STRIP

Cause of error: Using the potential-flow calculation results, the simulation program can not locate the stagnation point to separate the lifting strip into two boundary-layer strips.

Action: Check the input and output data of the potential-flow program.

b. Message: TØTAL PØINT IN SETUP NØT EQUAL TØ TØTAL CØNTRØL PØINT, PRØGRAM ENDS FØR CØRRECTIØN

Cause of error: In generating the new onset flow, the program checks the total number of control points with the control elements that are currently being worked on. If these two numbers do not agree, this message is printed.

Action: Check that the total number of control elements is passed correctly into here, and also check to see if some of the control points have been skipped.

c. Message: ELEMENTS INPUT TØ B.L. PRØGRAM = xxxxx. ELEMENTS RETURN TØ CALLING PRØGRAM = xxxxx. PRØGRAM STØPS.

Cause of error: Inconsistent source element count.

Action: Check that the number of source elements per strip stored on the external unit is agreeable with the number already stored in core.

d. Message: STRIP CØUNT ERRØR IN UNIT 3

Cause of error: The strip number stored on unit 3 with the δ^*s is incorrect.

Action: Check that the total number of lifting strips is correctly passed.

e. Message: STRIP CØUNT DIFFERS FRØM TAPE IDEL

Cause of error: The strip counter recorded on the unit IDEL for the lifting section is not the same as the strip number being used at the time the error occurs.

Action: Check the contents of the unit IDEL.

f. Message: ELEMENT NØ. DIFFERS FRØM TAPE IDEL

Cause of error: The number of on-body elements recorded on unit 3 is incorrect.

Action: Check the contents of the unit 3.

g. Message: FINAL STRIP DIFFERS FRØM TAPE IDEL

Cause of error: The total number of lifting strip count is not agreeable with the strip index on unit 3.

Action: Check the contents of unit 3.

h. Message: WAKE ELEMENT CØUNT ERRØR. K1 = XXX M1 = XXX EXECUTIØN STØPS WITH ERRØR CØDE 20

Cause of error: Generated total number of on-body points plus wake points is not the same as stored from the initial potential flow calculation.

Action: Check that the correct number of on-body elements and wakes are stored and passed to this part of the program correctly.

i. Message: IWAKE = XXXXX IWK = XXXXX STØP 19

Cause of error: The number of generated wake elements is not the same as stored from the initial potential-flow calculation.

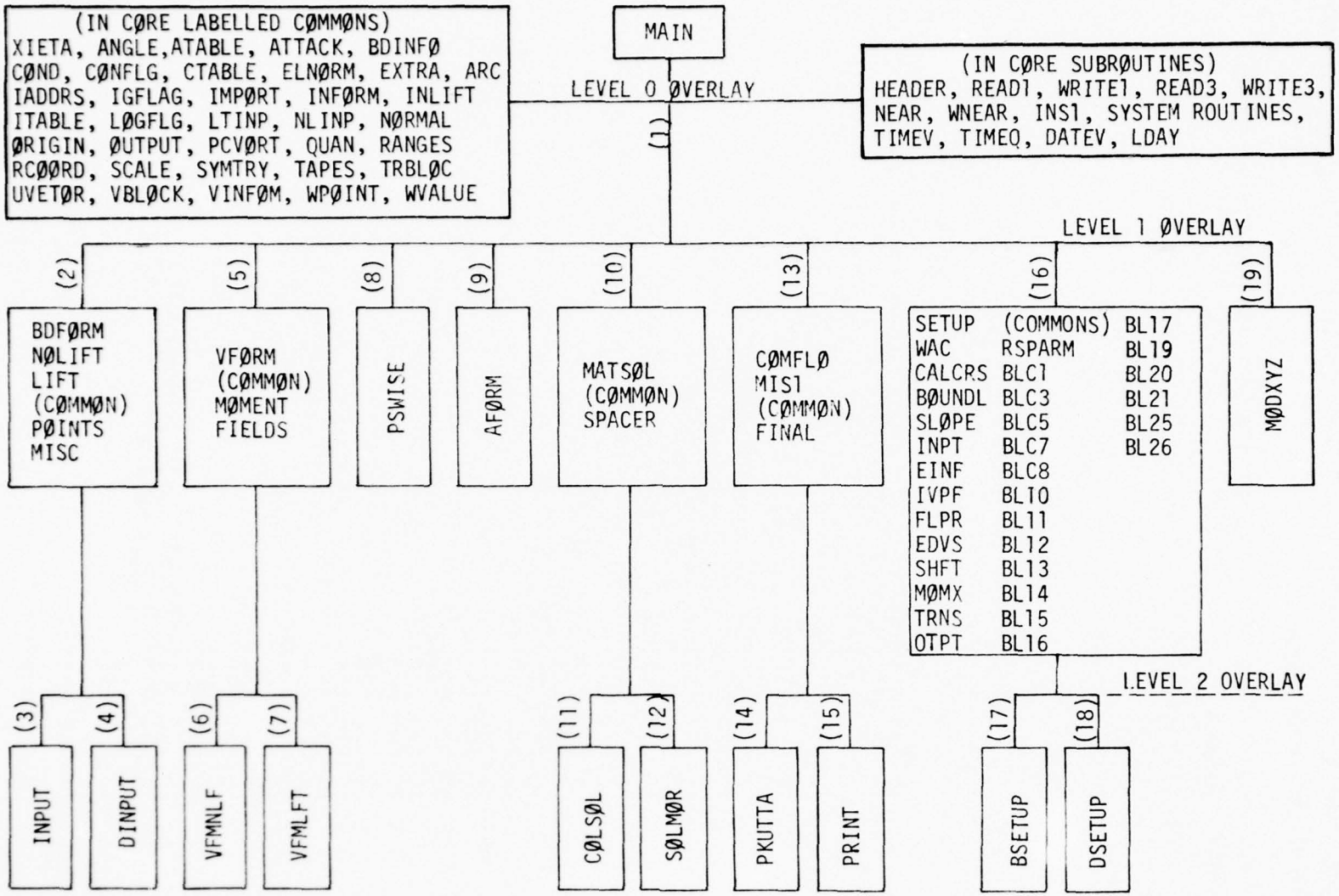
Action: Check the number of elements and wakes generated in this part of the program.

7.0 DECK SETUP

This section illustrates how the input deck should be set up for various types of computer runs. The overlay arrangements and the job control cards illustrated are good for the IBM 370/165 systems only. Proper conversion should be made when other systems are used.

7.1 Overlay Structure

Because of the size and the structure of the program, it is beneficial to use the overlay technique to minimize the case region when executing it. The overlay structure is shown with segment numbers on the following page.


(IN CØRE LABELLED CØMMØNS)
XIETA, ANGLE,ATABLE, ATTACK, BDINFØ
CØND, CØNFLG, CTABLE, ELNØRM, EXTRA, ARC
IADDRS, IGFLAG, IMPØRT, INFØRM, INLIFT
ITABLE, LØGFLG, LTINP, NLINP, NØRMAL
ØRIGIN, ØUTPUT, PCVØRT, QUAN, RANGES
RCØØRD, SCALE, SYMTRY, TAPES, TRBLØC
UVETØR, VBLØCK, VINFØM, WPØINT, WVALUE
MAIN
LEVEL 0 ØVERLAY
(1)
(IN CØRE SUBRØUTINES)
HEADER, READ1, WRITE1, READ3, WRITE3,
NEAR, WNEAR, INS1, SYSTEM ROUTINES,
TIMEV, TIMEQ, DATEV, LDAY
LEVEL 1 ØVERLAY
(2)
BDFØRM
NØLIFT
LIFT
(CØMMØN)
PØINTS
MISC
(5)
VFØRM
(CØMMØN)
MØMENT
FIELDS
(8)
PSWISE
(9)
AFØRM
(10)
MATSØL
(CØMMØN)
SPACER
(13)
CØMFLØ
MIS1
(CØMMØN)
FINAL
(16)
SETUP (COMMONS) BL17
WAC RSPARM BL19
CALCRS BLC1 BL20
BØUNDL BLC3 BL21
SLØPE BLC5 BL25
INPT BLC7 BL26
EINF BLC8
IVPF BL10
FLPR BL11
EDVS BL12
SHFT BL13
MØMX BL14
TRNS BL15
OTPT BL16
(19)
MØDXYZ
LEVEL 2 OVERLAY
(3)
INPUT
(4)
DINPUT
(6)
VFMNLF
(7)
VFMLFT
(11)
CØLSØL
(12)
SØLMØR
(14)
PKUTTA
(15)
PRINT
(17)
BSETUP
(18)
DSETUP

This page shows the overlay control cards corresponding to the overlay structure shown on the previous page.

```
         1         2         3         4         5         6
1234567890123456789012345678901234567890123456789012345678901234567890
    \
     \--(Card Columns)

      OVERLAY ALPHA
           INSERT BDFORM
           INSERT POINTS
           INSERT MISC
           INSERT NOLIST
           INSERT LIST
        OVERLAY BETA
           INSERT INPUT
        OVERLAY BETA
           INSERT DINPUT
      OVERLAY ALPHA
           INSERT VFORM
           INSERT MOMENT
           INSERT FIELDS
        OVERLAY BETA
           INSERT VFMNLF
        OVERLAY BETA
           INSERT VFMLFT
      OVERLAY ALPHA
           INSERT PSWISE
      OVERLAY ALPHA
           INSERT AFORM
      OVERLAY ALPHA
           INSERT MATSOL
           INSERT SPACER
        OVERLAY BETA
           INSERT COLSOL
        OVERLAY BETA
           INSERT SOLMOR
      OVERLAY ALPHA
           INSERT COMELF
           INSERT MTS1
           INSERT FINAL
        OVERLAY BETA
           INSERT BKUTTA
        OVERLAY BETA
           INSERT PRINT
      OVERLAY ALPHA
           INSERT SETUP
           INSERT WAC
           INSERT CALCRS
           INSERT RSPARM
           INSERT BL12
           INSERT BCUNOL
           INSERT INPT
           INSERT FINE
           INSERT IVDE
           INSERT ELDE
           INSERT EDVS
           INSERT SHET
           INSERT MOMX
           INSERT TRNS
           INSERT SLOPE
           INSERT OTPT
           INSERT BLC1,BLC3,BLC5,BLC7,BLC8,BL10,BL11
           INSERT BL13,BL14,BL15,BL16,BL17,BL19
           INSERT BL20,BL21,BL25,BL26
        OVERLAY BETA
           INSERT RSETUP
        OVERLAY BETA
           INSERT DSETUP
      OVERLAY ALPHA
           INSERT MODXY7
```

7.2 The Data Definition Cards (DD Cards) for the External Units

There are 17 external units required by this program. Special attention should be paid to the SPACE parameter. The number of tracks denoted in the SPACE parameter depends on the total number of input elements that defines the basic body. For instance, the unit that stored the Aij matrix for a 300-element case may require 40 tracks on a 3330 disk, the same unit when used to store a 1000 element case will require 320 tracks. User should estimate the track sizes before submitting a computer run.

Example No. 1 shows the DD Cards for cases with less than 400 elements and example No. 2 shows them for cases of 1000 elements or less.

7.3 Job Control Language Cards

The IBM/370 JCL card setup for two types of computer run is shown below. The first example shows a CØMPILE, LINKEDIT and GØ job. The second one shows the GØ step alone, i.e., executing the program which is already stored on a disk pack.

In these two examples, the data set name DAC.EOH3,DPM.J1HB.V2 is used. The volume on which the data set is stored is called CSLB3O. The DD cards from examples 1 or 2 may be used or redefined by the user depending on the case size.

7.3.1 JCL Setup for Compile, Linkedit and Go. (First line is the card column identifier, not a JCL card.) The deck setup for this kind of job is shown in example No. 3.

7.3.2 JCL Setup for Executing the Program Already Stored on Disk. (First line is the card column identifier, not a JCL card.) This type of run is shown in example No. 4.

EXAMPLE NO. 1

External Unit DD Cards for Cases Less than 400 Elements

```
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
          1         2         3         4         5         6         7         8
(Card Columns)

//GO.FT01F001 DD DSNAME=&FT01,UNIT=SYSDA,SPACE=(TRK,(50,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT02F001   DD  DSN=&FT02,UNIT=SYSDA,SPACE=(TRK,(50,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT03F001 DD DSNAME=&FT03,UNIT=SYSDA,SPACE=(TRK,(50,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT04F001   DD  DSN=&FT04,UNIT=SYSDA,SPACE=(TRK,(50,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT07F001 DD SYSOUT=B
//GO.FT08F001 DD DSNAME=&FT08,UNIT=SYSDA,SPACE=(TRK,(50,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT09F001 DD DSNAME=&FT09,UNIT=SYSDA,SPACE=(TRK,(50,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT10F001 DD DSNAME=&FT10,UNIT=SYSDA,SPACE=(TRK,(50,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT11F001 DD DSNAME=&FT11,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT12F001 DD DSNAME=&FT12,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT13F001 DD DSNAME=&FT13,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT14F001 DD DSNAME=&FT14,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT15F001 DD DSNAME=&FT15,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT16F001 DD DSNAME=&FT16,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT17F001 DD DSNAME=&FT17,UNIT=SYSDA,SPACE=(TRK,(10,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT18F001 DD DSNAME=&FT18,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT19F001 DD DSNAME=&FT19,UNIT=SYSDA,SPACE=(TRK,(10,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
```

EXAMPLE NO. 2

External Unit DD Cards for Cases Less than or Equal to 1000 Elements

```
1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  \_____(Card Columns)

//GO.FT01F001 DD DSNAME=&FT01,UNIT=SYSDA,SPACE=(TRK,(50,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT02F001  DD  DSN=&FT02,UNIT=SYSDA,SPACE=(TRK,(50,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT03F001 DD DSN=&FT03,UNIT=SYSDA,SPACE=(TRK,(50,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT04F001 DD DSN=&FT04,UNIT=SYSDA,SPACE=(TRK,(30,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT08F001 DD DSN=&FT08,UNIT=SYSDA,SPACE=(TRK,(100,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT09F001 DD DSN=&FT09,UNIT=SYSDA,SPACE=(TRK,(350,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT10F001 DD DSN=&FT10,UNIT=SYSDA,SPACE=(TRK,(350,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT11F001 DD DSN=&FT11,UNIT=SYSDA,SPACE=(TRK,(450,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT12F001 DD DSN=&FT12,UNIT=SYSDA,SPACE=(TRK,(450,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT13F001 DD DSN=&FT13,UNIT=SYSDA,SPACE=(TRK,(350,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT14F001 DD DSN=&FT14,UNIT=SYSDA,SPACE=(TRK,(350,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT15F001 DD DSN=&FT15,UNIT=SYSDA,SPACE=(TRK,(350,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT16F001 DD DSN=&FT16,UNIT=SYSDA,SPACE=(TRK,(350,10)),
//              DCB=(RECFM=VBS,BLKSIZE=13030,BUFNO=1)
//GO.FT17F001 DD DSN=&FT17,UNIT=SYSDA,SPACE=(TRK,(50,10)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT18F001 DD DSNAME=&FT18,UNIT=SYSDA,SPACE=(TRK,(75,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
//GO.FT19F001 DD DSNAME=&FT19,UNIT=SYSDA,SPACE=(TRK,(10,5)),
//              DCB=(RECFM=VBS,BLKSIZE=6447,BUFNO=1)
```

EXAMPLE NO. 3

JCL Cards for CØMPILE, LINKEDIT and GØ

```
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
          1         2         3         4         5         6         7         8
```

(Card Columns)

```
//   EXEC   FORTXCLG,PARM.FORT='OPT=2,XREF',PARM.LKED='MAP,LIST,OVLY',
//               REGION.GO=280K
//FORT.SYSUT2   DD   DSN=&SYSUT2,UNIT=SYSDA,SPACE=(TRK,(5,5))
//FORT.SYSIN   DD   *
```

(Insert Fortran Deck here.)

```
/*
//LKED.SYSIN   DD   *
      ENTRY MAIN
```

(Insert Overlay cards here.)

```
/*
```

(Insert DD cards here.)

```
//GO.SYSUDUMP   DD SYSOUT=A,SPACE=(TRK,(200),RLSE)
//GO.SYSIN   DD   *
```

(Insert data cards here.)

```
/*
//
```

EXAMPLE NO. 4

JCL Cards for Executing the Program Already Stored on Disk

```
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
          1         2         3         4         5         6         7         8
```

(Card Columns)

```
//JOBLIB   DD   DSN=DAC.FOH3.DRM.J1HB.V2,DISP=(SHR,PASS),UNIT=2330-1,
//               VOL=SER=CSLB30
//   EXEC   FORTGC,REGION=280K
```

(Insert DD cards here.)

```
//GO.SYSUDUMP   DD SYSOUT=A,SPACE=(TRK,(200),RLSE)
//GO.SYSIN   DD   *
```

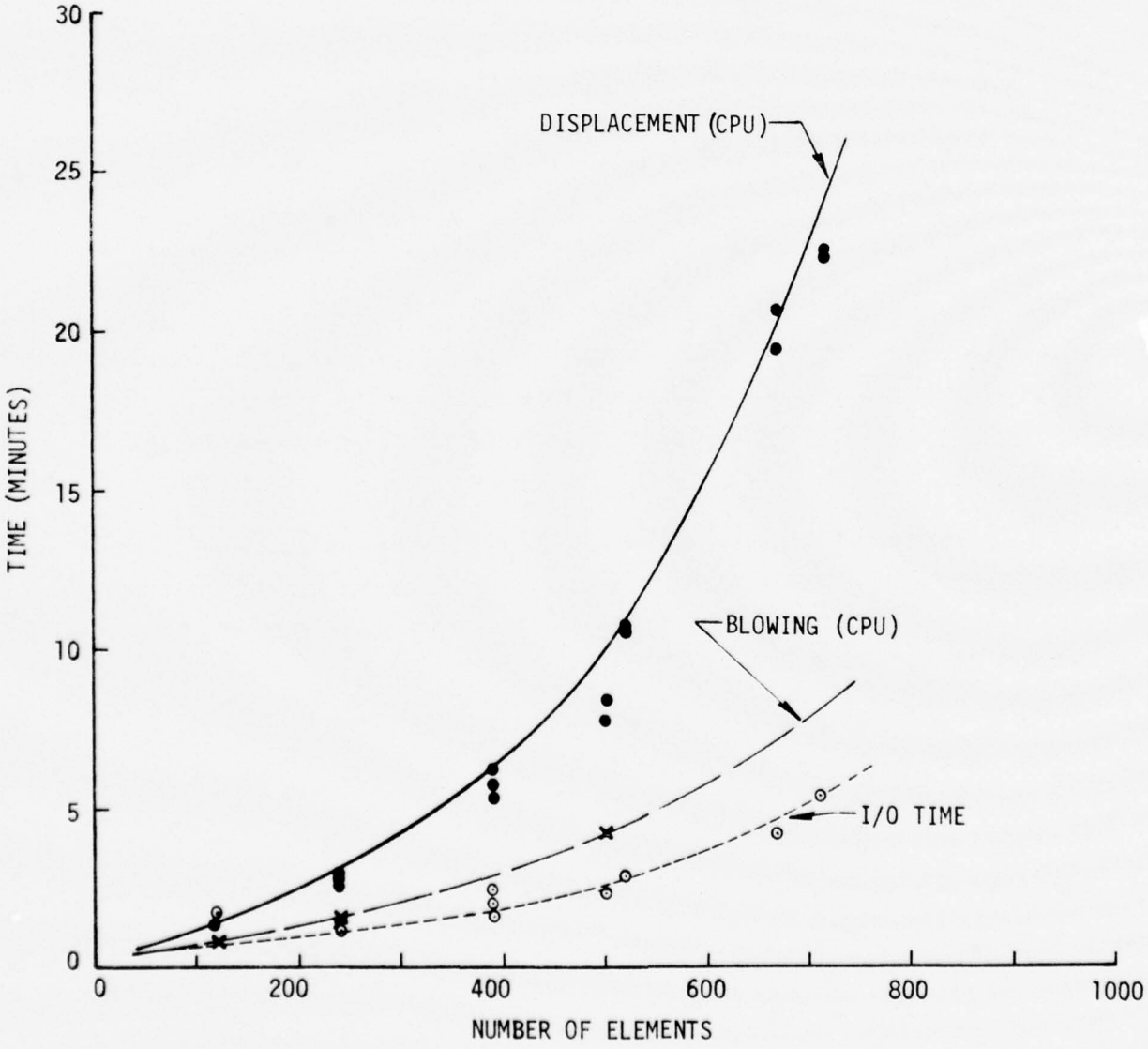
(Insert data cards here.)

```
/*
//
```

7.4 Run Time Estimation

The estimation of run time depends a great deal on the total number of elements that depicts the input body, and the number of lifting strips. In general, the surface displacement method will run longer than the blowing method.

The figure below shows the number of elements versus time in minutes. The points shown on the figure are the actual data from various runs made on the IBM/370 systems. Users may apply these curves as a guide for their CPU time estimation.



8.0 TEST CASE

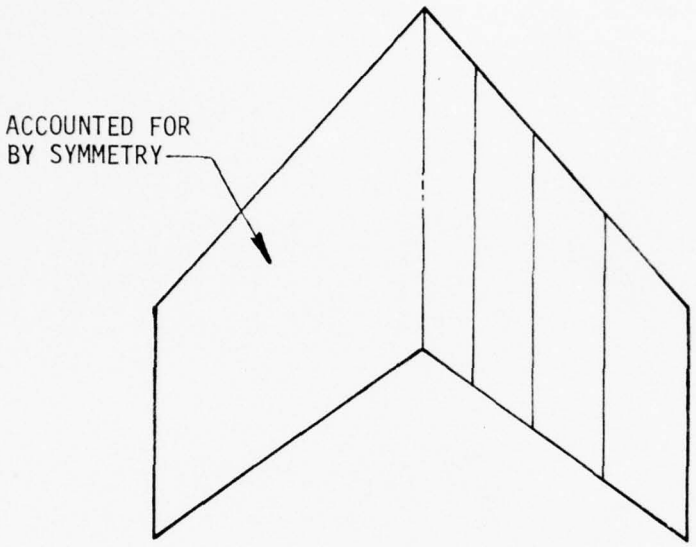
8.1 Test Case Input Data

The test case is a four strip swept wing with a symmetric airfoil section run at $\alpha = 8.22°$. Listed below are the options used:

1.	One angle of attack	IATACK=1
2.	One plane of symmetry	SYM1=1.0
3.	One lifting section	LIFSEC=1
4.	Special formula for last wake	LASWAK=1
5.	Stepwise vorticity	IWIDTH=0
6.	Equal pressure Kutta conditions	ISAVE=1
7.	Case 1, blowing method	BL=1.0
8.	Case 2, displacement method	BL=2.0
9.	Input foot-converter	FC=12.0

The lifting body input consists of 4 lifting strips, and on each strip there are 30 on-body elements and 1 wake element. A sketch of this body geometry showing the wing planform with the strip locations, and the airfoil configuration with its defining elements (without wake element) is presented on the following page.

A complete set of data for test case No. 1 (blowing) is included in the following pages. For test case No. 2 (surface displacement), only the first two cards (group 1, type 1 and 2) from case No. 1 need to be changed, hence, only these two cards are listed.



WING PLANFORM

AIRFOIL SECTION

Sketch of Test Case Geometry.

TEST CASE NO. 1 (Blowing Method)

```
        1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   ↖——(Card Columns)

FOUR STRIP NACA SWEPT WING. A=3.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.
NACA  1                                  1   1      1     1.0      1.0 12.0
 0.989707   0.          0.142106
```

Group 1

```
  30    1    4    0
62.71      30.90        .0          21  61.6008    30.90      -.1006599
60.4594    30.90      -.193656          58.1290    30.90      -.4037489
55.6860    30.90      -.6136640         53.1321    30.90      -.806943
50.4589    30.90      -.9616537         47.6582    30.90     -1.050412
44.7215    30.90     -1.0418161         41.6352    30.90      -.9430973
38.9636    30.90      -.7243076         36.7076    30.90      -.5338025
35.8507    30.90      -.3803838         35.4154    30.90      -.2836779
35.1547    30.90      -.1866229         34.68      30.90       .0
35.1547    30.90       .1866229         35.4154    30.90       .2836779
35.8507    30.90       .3803838         36.7076    30.90       .5338025
38.9636    30.9        .7243076         41.6352    30.9        .9430973
44.7215    30.9       1.0418161         47.6582    30.9       1.0504124
50.4589    30.9        .9616537         53.1321    30.9        .806943
55.6860    30.9        .6136640         58.1290    30.9        .4037489
60.4594    30.9        .193656          61.6008    30.9        .1006599
62.71      30.9        .0               63.8102    30.9        .0
55.83      20.9        .0          1    54.5432    20.9       -.1167771
53.2207    20.9       -.231624          50.5155    20.9       -.4683952
47.6813    20.9       -.7119221         44.7185    20.9       -.936147
41.6173    20.9      -1.1159277         39.3481    20.9      -1.2186
34.9613    20.9      -1.2086260         31.3809    20.9      -1.0941017
27.6201    20.9       -.8402804         25.6642    20.9       -.6192725
24.6701    20.9       -.4523102         24.1651    20.9       -.3290991
23.8627    20.9       -.2165041         23.66      20.9        .0
23.8627    20.9        .2165041         24.1651    20.9        .3290991
24.6701    20.9        .4523102         25.6642    20.9        .6192725
27.6201    20.9        .8402804         31.3809    20.9       1.0941017
34.9613    20.9       1.2086260         33.3681    20.9       1.2135996
41.6173    20.9       1.1159273         44.7185    20.9        .936147
47.6813    20.9        .7119221         50.5155    20.9        .4683952
53.2207    20.9        .231624          54.5432    20.9        .1167771
55.83      20.9        .0               57.1168    20.9        .0
```

Group 2

TEST CASE NO. 1 (continued)

50.06	12.5	.0	!	48.6236	12.5	-.1303532
47.1585	12.5	-.253552		44.1277	12.5	-.5228496
40.9640	12.5	-.7946883		37.6567	12.5	-1.044081
34.1950	12.5	-1.245718		30.5681	12.5	-1.260271
26.7652	12.5	-1.340136		22.7684	12.5	-1.221209
18.5705	12.5	-.9379502		16.3872	12.5	-.6012675
15.2776	12.5	-.5048046		14.7138	12.5	-.3673592
14.3762	12.5	-.2416742		14.15	12.5	.0
14.3762	12.5	.2416742		14.7138	12.5	.3673592
15.2776	12.5	.5048046		16.3872	12.5	.6012675
18.5705	12.5	.9379502		22.7684	12.5	1.221209
26.7652	12.5	1.340136		30.5681	12.5	1.260271
34.1950	12.5	1.245718		37.6567	12.5	1.044081
40.9640	12.5	.7946883		44.1277	12.5	.5228496
47.1585	12.5	.253552		48.6236	12.5	.1303532
50.06	12.5	.0		51.4864	12.5	.0
45.30	5.7	.0	!	42.8324	5.7	-.1413522
42.2436	5.7	-.2803688		38.0571	5.7	-.5660664
35.5265	5.7	-.8617422		31.0401	5.7	-1.133154
28.1863	5.7	-1.350838		24.2534	5.7	-1.475047
20.1206	5.7	-1.462078		15.7956	5.7	-1.324340
11.2435	5.7	-1.017113		8.8760	5.7	-.749595
7.6727	5.7	-.5474064		7.0614	5.7	-.3983552
6.6953	5.7	-.2620662		6.45	5.7	.0
6.6953	5.7	.2620662		7.0614	5.7	.3983552
7.6727	5.7	.5474064		8.8760	5.7	.749595
11.2435	5.7	1.017112		15.7956	5.7	1.3243404
20.1206	5.7	1.462078		24.2534	5.7	1.4750472
28.1863	5.7	1.350838		31.0401	5.7	1.133154
35.5265	5.7	.8617422		38.0571	5.7	.5660654
42.2436	5.7	.2803688		43.8324	5.7	.1413522
45.30	5.7	.0		46.9476	5.7	.0
41.47	0.0	.0	!	39.8112	0.0	-.1505361
38.1192	0.0	-.298584		34.6192	0.0	-.6038
30.9656	0.0	-.9177211		27.1463	0.0	-1.20673
23.1486	0.0	-1.438564		18.9601	0.0	-1.570884
14.5684	0.0	-1.558022		9.9528	0.0	-1.410395
5.1050	0.0	-1.083196		2.5836	0.0	-.798288
1.3022	0.0	-.5830682		.6511	0.0	-.4242381
.2613	0.0	-.2790931		.0	0.0	.0
.2613	0.0	.2790931		.6511	0.0	.4242381
1.3022	0.0	.5830682		2.5835	0.0	.798288
5.1050	0.0	1.083164		9.9528	0.0	1.4103947
14.5684	0.0	1.558022		18.9601	0.0	1.570884
23.1486	0.0	1.4385643		27.1463	0.0	1.206777
30.9656	0.0	.9177211		34.6192	0.0	.6038
38.1192	0.0	.298584		39.8112	0.0	.1505361
41.47	0.0	.0		43.1283	0.0	.0

Group 2 (continued)

TEST CASE NO. 1 (continued)

```
1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678900
```

(Card Column)

```
  223.2                6700300.0          1    0    0
10000
10000
10000
10000
10000
10000
10000
10000
```

Group 3

TEST CASE NO. 2 (Surface Displacement Method)

```
FOUR STRIP NACA SWEPT WING. A=3.22. 1 PL. SYM. DISPLMNT 30 SOURCE 1 WK.
NACA  1                        1  1    1    1.0      2.0 12.0
```

Group 1

(The remaining input data is identical to Case No. 1)

8.2 Test Case Output

The test case output in the following pages consists of:

a. Complete potential-flow-calculation output.

b. One strip of boundary-layer-calculation output.

c. Complete sets of final outputs for both blowing and surface displacement methods.

The initial potential-flow-computation output is identical in both blowing and surface displacement methods, and one set of this output is included here.

Due to the amount of printout generated in the boundary-layer calculation, only 1 strip of boundary-layer output is shown as an example since the other strips have the same output formats.

8.2.1 Initial Potential-Flow-Calculation Output. (Same for both blowing and displacement methods.)

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

---------- * ----------

CASE ID	---	NACA
LIFTING SECTIONS	---	1
KUTTA POINTS	---	0
OFF - BODY POINTS	---	0
UNIFORM ONSET FLOWS	---	1
IGNORE ELEMENT	---	0
MOMENT INPUT	---	0
SPECIAL LAST WAKE CALCULATION	---	1
PARTIAL EXECUTION	---	0
PIECEWISE LINEAR VORTICITY	---	0
STEP FUNCTION VORTICITY	---	1
SYMMETRY	---	1
BOUNDARY LAYER CALCULATION	---	1
INTERMEDIATE OUTPUT	----	0
PARABOLIC VORTICITY OPTION	----	0

(NONZEROS IMPLIED OPTIONS WERE SELECTED)

FOOT CONVERTER FACTOR INPUT ----12.0

COMPONENTS OF THE UNIFORM ONSET FLOWS

(1) 0.989707, 0.0 , 0.143106

---------- * ----------

OTHER INPUT INFORMATION WILL BE WRITTEN ELSEWHERE IN THE OUTPUT.

---------- * ----------

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

---------- * ----------

BEGIN THE SUBROUTINE INPUT . TIME IS 0.038 SEC.

BEGIN THE FORMATION OF ELEMENTS. TIME IS 0.079 SEC.

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
1	1	62.710007 30.899979 0.0	61.600800 30.899979 -0.100660	54.543182 20.899979 -0.116777	55.830002 20.899979 0.0	0.090204 -0.062060 -0.993988	58.584885 25.776428 -0.054459	1.3411E-07 1.2912E+01 1.2052E+01	LIFT
	2	61.600800 30.899979 -0.100660	60.469391 30.899979 -0.199656	53.230682 20.899979 -0.231624	54.543182 20.899979 -0.116777	0.087012 -0.059807 -0.994410	57.372711 25.776474 -0.162476	1.7434E-06 1.3041E+01 1.2288E+01	
	3	60.469391 30.899979 -0.199656	58.128983 30.899979 -0.403749	50.515503 20.899979 -0.468395	53.230682 20.899979 -0.231624	0.086719 -0.059595 -0.994449	55.494370 25.776413 -0.326453	1.0729E-06 1.4112E+01 2.5419E+01	
	4	58.128983 30.899979 -0.403749	55.685989 30.899979 -0.613665	47.681305 20.899979 -0.711922	50.515503 20.899979 -0.468395	0.085462 -0.058637 -0.994615	52.906448 25.776428 -0.550439	7.1526E-07 1.4465E+01 2.6529E+01	
	5	55.685989 30.899979 -0.613665	53.132080 30.899979 -0.806943	44.718491 20.899979 -0.936147	47.681305 20.899979 -0.711922	0.075367 -0.050544 -0.995974	50.203033 25.776443 -0.768573	8.0466E-07 1.4846E+01 2.7698E+01	
	6	53.132080 30.899979 -0.806943	50.458878 30.899979 -0.961953	41.617279 20.899979 -1.115976	44.718491 20.899979 -0.936147	0.057853 -0.035784 -0.997684	47.375092 25.776443 -0.957004	5.8115E-07 1.5254E+01 2.8939E+01	
	7	50.458878 30.899979 -0.961953	47.658188 30.899979 -1.050411	38.368103 20.899979 -1.218599	41.617279 20.899979 -1.115976	0.031566 -0.012516 -0.999423	44.413589 25.776413 -1.088724	5.8115E-07 1.5692E+01 3.0267E+01	
	8	47.658188 30.899979 -1.050411	44.721497 30.899979 -1.041816	34.961288 20.899979 -1.208626	38.368103 20.899979 -1.218599	-0.002927 0.019534 -0.999805	41.309601 25.776459 -1.131930	8.9407E-08 1.6163E+01 3.1724E+01	
	9	44.721497 30.899979 -1.041816	41.635178 30.899979 -0.943097	31.380798 20.899979 -1.094101	34.961288 20.899979 -1.208626	-0.031933 0.047821 -0.998346	38.051025 25.776428 -1.073872	1.3746E-06 1.6673E+01 3.3389E+01	
	10	41.635178 30.899979 -0.943097	38.393600 30.899979 -0.724308	27.620087 20.899979 -0.840280	31.380798 20.899979 -1.094101	-0.067104 0.083824 -0.994219	34.627487 25.776413 -0.902095	1.9725E-06 1.7217E+01 3.5215E+01	
	11	38.393600 30.899979 -0.724308	36.707581 30.899979 -0.533903	25.664200 20.899979 -0.619272	27.620087 20.899979 -0.840280	-0.111306 0.131340 -0.985069	31.961624 25.776474 -0.680659	1.1176E-06 1.6188E+01 1.8486E+01	
	12	36.707581 30.899979 -0.533903	35.850677 30.899979 -0.389884	24.670090 20.899979 -0.452310	25.664200 20.899979 -0.619272	-0.162682 0.187935 -0.968615	30.585846 25.776443 -0.499731	1.0338E-07 1.5650E+01 9.5548E+00	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

---------- * ----------

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
1	13	35.350677 30.899979 -0.338884	35.415390 30.899979 -0.283678	24.165085 20.899979 -0.329099	24.670090 20.899979 -0.452310	-0.228777 0.261641 -0.937659	29.886734 25.776428 -0.364409	1.1260E-06 1.5380E+01 5.0140E+00	LIFT
	14	35.415390 30.899979 -0.283678	35.154694 30.899979 -0.186623	23.862686 20.899979 -0.216504	24.165085 20.899979 -0.329099	-0.324309 0.368814 -0.871091	29.510330 25.776535 -0.254440	2.0368E-06 1.5280E+01 3.2323E+00	
	15	35.154694 30.899979 -0.186623	34.979980 30.899979 0.0	23.659988 20.899979 0.0	23.862686 20.899979 -0.216504	-0.562733 0.637013 -0.526826	29.274643 25.776428 -0.100966	2.7493E-06 1.5237E+01 3.5819E+00	
	16	34.979980 30.899979 0.0	35.154694 30.899979 0.186623	23.862686 20.899979 0.216504	23.659988 20.899979 0.0	-0.562733 0.637013 0.526826	29.274643 25.776428 0.100966	2.4140E-06 1.5237E+01 3.5819E+00	
	17	35.154694 30.899979 0.186623	35.415390 30.899979 0.283678	24.165085 20.899979 0.329099	23.862686 20.899979 0.216504	-0.324309 0.368814 0.871091	29.510330 25.776535 0.254440	3.9339E-06 1.5280E+01 3.2323E+00	
	18	35.415390 30.899979 0.283678	35.850677 30.899979 0.338884	24.670090 20.899979 0.452310	24.165085 20.899979 0.329099	-0.228777 0.261641 0.937659	29.886734 25.776428 0.364409	4.9174E-07 1.5380E+01 5.0140E+00	
	19	35.350677 30.899979 0.338884	36.707581 30.899979 0.533803	25.664200 20.899979 0.619272	24.670090 20.899979 0.452310	-0.162682 0.187935 0.968615	30.585846 25.776443 0.499731	7.5996E-07 1.5650E+01 9.5548E+00	
	20	36.707581 30.899979 0.533803	38.393600 30.899979 0.724308	27.620087 20.899979 0.840280	25.664200 20.899979 0.619272	-0.111306 0.131340 0.985069	31.961624 25.776474 0.680659	2.3693E-06 1.6188E+01 1.8486E+01	
	21	38.393600 30.899979 0.724308	41.635178 30.899979 0.943097	31.380798 20.899979 1.094101	27.620087 20.899979 0.840280	-0.067104 0.083824 0.994219	34.627487 25.776413 0.902095	7.1526E-07 1.7217E+01 3.5215E+01	
	22	41.635178 30.899979 0.943097	44.721497 30.899979 1.041816	34.961288 20.899979 1.208626	31.380798 20.899979 1.094101	-0.031933 0.047821 0.998346	38.051025 25.776429 1.073872	2.2352E-07 1.6673E+01 3.3399E+01	
	23	44.721497 30.899979 1.041816	47.658188 30.899979 1.050411	38.368103 20.899979 1.218598	34.961288 20.899979 1.208626	-0.002927 0.019534 0.999805	41.309601 25.776459 1.131930	4.4703E-07 1.6163E+01 3.1724E+01	
	24	47.658188 30.899979 1.050411	50.458878 30.899979 0.961653	41.617279 20.899979 1.115976	38.368103 20.899979 1.218598	0.031615 -0.012546 0.999421	44.413605 25.776428 1.088651	8.1366E-05 1.5692E+01 3.0267E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
1	25	50.453878 30.899979 0.961653	53.132080 30.899979 0.806943	44.718491 20.899979 0.936147	41.617279 20.899979 1.115976	0.057801 -0.035725 0.997689	47.375076 25.776428 0.956930	8.0095E-05 1.5254E+01 2.8939E+01	LIFT
	26	53.132080 30.899979 0.806943	55.685989 30.899979 0.613665	47.681305 20.899979 0.711922	44.718491 20.899979 0.936147	0.075367 -0.050544 0.995874	50.203033 25.776443 0.768573	2.1514E-07 1.4946E+01 2.7693E+01	
	27	55.685989 30.899979 0.613665	58.128983 30.899979 0.403749	50.515503 20.899979 0.468395	47.681305 20.899979 0.711922	0.085462 -0.058637 0.994615	52.906448 25.776428 0.550439	7.1526E-07 1.4465E+01 2.6529E+01	
	28	58.128983 30.899979 0.403749	60.469391 30.899979 0.199656	53.230682 20.899979 0.231624	50.515503 20.899979 0.468395	0.086719 -0.059595 0.994449	55.494370 25.776413 0.326453	9.3877E-07 1.4112E+01 2.5419E+01	
	29	60.469391 30.899979 0.199656	61.600800 30.899979 0.100660	54.543182 20.899979 0.116777	53.230682 20.899979 0.231624	0.087012 -0.059807 0.994410	57.372711 25.776474 0.162476	6.7335E-07 1.3041E+01 2.2288E+01	
	30	61.600800 30.899979 0.100660	62.710007 30.899979 0.0	55.830002 20.899979 0.0	54.543182 20.899979 0.116777	0.090204 -0.062060 0.993988	58.584885 25.776428 0.054459	4.0792E-07 1.2912E+01 2.2052E+01	
	31	62.710007 30.899979 0.0	63.819183 30.899979 0.0	57.116791 20.899979 0.0	55.830002 20.899979 0.0	0.0 0.0 1.000000	59.785080 25.776428 0.0	0.0 1.2799E+01 1.1980E+01	WAKE
2	1	55.830002 20.899979 0.0	54.543182 20.899979 -0.116777	48.623581 12.499992 -0.130353	50.059982 12.499992 0.0	0.090204 -0.061962 -0.993994	52.210648 16.623062 -0.061845	7.5996E-07 1.1068E+01 1.1507E+01	LIFT
	2	54.543182 20.899979 -0.116777	53.230682 20.899979 -0.231624	47.158493 12.499992 -0.258552	48.623581 12.499992 -0.130353	0.087014 -0.059713 -0.994416	50.834076 16.623062 -0.184512	2.2352E-07 1.1185E+01 1.1731E+01	
	3	53.230682 20.899979 -0.231624	50.515503 20.899979 -0.468395	44.127686 12.499992 -0.522850	47.158493 12.499992 -0.258552	0.086720 -0.059500 -0.994455	48.701050 16.623077 -0.370727	1.1623E-06 1.2390E+01 2.4268E+01	
	4	50.515503 20.899979 -0.468395	47.681305 20.899979 -0.711922	40.963989 12.499992 -0.794688	44.127686 12.499992 -0.522850	0.085462 -0.058542 -0.994620	45.762115 16.623062 -0.625091	2.6922E-07 1.2724E+01 2.5327E+01	
	5	47.681305 20.899979 -0.711922	44.718491 20.899979 -0.936147	37.656693 12.499992 -1.044990	40.963989 12.499992 -0.794688	0.075367 -0.050458 -0.995379	42.692001 16.623047 -0.872811	3.1292E-07 1.3083E+01 2.6443E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
2	6	44.713491 20.899979 -0.935147	41.617279 20.899979 -1.115976	34.194992 12.499992 -1.245718	37.656693 12.499992 -1.044980	0.057854 -0.035710 -0.997686	39.480560 16.623077 -1.086797	1.2964E-06 1.3468E+01 2.7628E+01	LIFT
	7	41.617279 20.899979 -1.115976	38.368103 20.899979 -1.218599	30.568085 12.499992 -1.360271	34.194992 12.499992 -1.245718	0.031566 -0.012456 -0.999424	36.117416 16.623062 -1.236382	9.3877E-07 1.3882E+01 2.8896E+01	
	8	38.368103 20.899979 -1.218599	34.961288 20.899979 -1.208626	26.765182 12.499992 -1.349138	30.568085 12.499992 -1.360271	-0.002927 0.019580 -0.999804	32.592407 16.623062 -1.285449	6.2585E-07 1.4325E+01 3.0287E+01	
	9	34.961288 20.899979 -1.208626	31.380798 20.899979 -1.094101	22.768387 12.499992 -1.221299	26.765182 12.499992 -1.349138	-0.031933 0.047858 -0.998344	28.891937 16.623062 -1.219516	6.7335E-07 1.4806E+01 3.1877E+01	
	10	31.380798 20.899979 -1.094101	27.620087 20.899979 -0.840280	18.570480 12.499992 -0.937969	22.768387 12.499992 -1.221299	-0.067103 0.083854 -0.994216	25.004059 16.623062 -1.024441	3.1292E-07 1.5320E+01 3.3621E+01	
	11	27.620087 20.899979 -0.840280	25.664200 20.899979 -0.619272	16.387207 12.499992 -0.691267	18.570480 12.499992 -0.937969	-0.111308 0.131372 -0.985065	21.976593 16.623077 -0.772973	2.6822E-07 1.4027E+01 1.7648E+01	
	12	25.664200 20.899979 -0.619272	24.670090 20.899979 -0.452310	15.277599 12.499992 -0.504895	16.387207 12.499992 -0.691267	-0.162686 0.187972 -0.968607	20.414337 16.623093 -0.567506	2.4587E-06 1.3359E+01 9.1219E+00	
	13	24.670090 20.899979 -0.452310	24.165085 20.899979 -0.329099	14.713795 12.499992 -0.367359	15.277599 12.499992 -0.504895	-0.228752 0.261651 -0.937663	19.620255 16.622971 -0.413832	6.2333E-06 1.3027E+01 4.7874E+00	
	14	24.165085 20.899979 -0.329099	23.862686 20.899979 -0.216504	14.376194 12.499992 -0.241674	14.713795 12.499992 -0.367359	-0.324310 0.368867 -0.871068	19.192657 16.623016 -0.288950	4.6017E-06 1.2899E+01 3.0859E+00	
	15	23.862686 20.899979 -0.216504	23.659988 20.899979 0.0	14.149990 12.499992 0.0	14.376194 12.499992 -0.241674	-0.562718 0.637079 -0.526762	18.925339 16.623154 -0.114660	3.7551E-06 1.2843E+01 3.4197E+00	
	16	23.659988 20.899979 0.0	23.862686 20.899979 0.216504	14.376194 12.499992 0.241674	14.149990 12.499992 0.0	-0.562718 0.637079 0.526762	18.925339 16.623154 0.114660	1.1265E-05 1.2843E+01 3.4197E+00	
	17	23.862686 20.899979 0.216504	24.165085 20.899979 0.329099	14.713795 12.499992 0.367359	14.376194 12.499992 0.241674	-0.324310 0.368867 0.871068	19.192657 16.623016 0.288950	2.4587E-06 1.2899E+01 3.0859E+00	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
2	18	24.165095 20.399979 0.329039	24.670090 20.899979 0.452310	15.277599 12.499992 0.504895	14.713795 12.499992 0.367359	-0.228752 0.261651 0.937663	19.620255 16.622971 0.413832	3.3081E-06 1.3027E+01 4.7874E+00	LIFT
	19	24.670090 20.399979 0.452310	25.664200 20.899979 0.619272	16.387207 12.499992 0.691267	15.277599 12.499992 0.504895	-0.162686 0.187972 0.968607	20.414337 16.623093 0.567506	3.1292E-06 1.3359E+01 9.1219E+00	
	20	25.664200 20.899979 0.619272	27.620087 20.899979 0.840280	18.570480 12.499992 0.937969	16.387207 12.499992 0.691267	-0.111308 0.131372 0.985065	21.976593 16.623077 0.772373	4.4703E-08 1.4027E+01 1.7648E+01	
	21	27.620087 20.899979 0.840280	31.380798 20.899979 1.094101	22.768387 12.499992 1.221299	18.570480 12.499992 0.937969	-0.067103 0.083854 0.994216	25.004059 16.623062 1.024441	4.0233E-07 1.5320E+01 3.3621E+01	
	22	31.380798 20.899979 1.094101	34.961288 20.899979 1.208626	26.765182 12.499992 1.349138	22.768387 12.499992 1.221299	-0.031933 0.047858 0.998344	28.891937 16.623062 1.219516	5.8115E-07 1.4806E+01 3.1877E+01	
	23	34.961288 20.899979 1.208626	38.368103 20.899979 1.213598	30.568085 12.499992 1.360269	26.765182 12.499992 1.349138	-0.002926 0.019580 0.999804	32.592407 16.623062 1.285449	8.9407E-08 1.4325E+01 3.0287E+01	
	24	38.368103 20.899979 1.213598	41.617279 20.899979 1.115976	34.194992 12.499992 1.245718	30.568085 12.499992 1.360269	0.031566 -0.012455 0.999424	36.117416 16.623062 1.236382	2.7940E-09 1.3892E+01 2.8896E+01	
	25	41.617279 20.899979 1.115976	44.718491 20.899979 0.936147	37.656693 12.499992 1.044980	34.194992 12.499992 1.245718	0.057854 -0.035710 0.997686	39.480560 16.623077 1.086797	8.8569E-07 1.3469E+01 2.7628E+01	
	26	44.718491 20.899979 0.936147	47.681305 20.899979 0.711922	40.963989 12.499992 0.794688	37.656693 12.499992 1.044980	0.075367 -0.050458 0.995879	42.692001 16.623047 0.872811	1.1176E-06 1.3083E+01 2.6443E+01	
	27	47.681305 20.899979 0.711922	50.515503 20.899979 0.468395	44.127686 12.499992 0.522850	40.963989 12.499992 0.794688	0.085462 -0.058542 0.994620	45.762115 16.623062 0.625091	8.9407E-08 1.2724E+01 2.5327E+01	
	28	50.515503 20.899979 0.468395	53.230682 20.899979 0.231624	47.158493 12.499992 0.258552	44.127686 12.499992 0.522850	0.086720 -0.059500 0.994455	48.701050 16.623077 0.370727	8.9407E-07 1.2390E+01 2.4268E+01	
	29	53.230682 20.899979 0.231624	54.543182 20.899979 0.116777	48.623591 12.499992 0.130353	47.158493 12.499992 0.258552	0.087014 -0.059713 0.994416	50.834076 16.623062 0.184512	7.1526E-07 1.1185E+01 1.1731E+01	

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
2	30	54.543182 20.399979 0.116777	55.830002 20.899979 0.0	50.059982 12.499992 0.0	48.623581 12.499992 0.130353	0.090204 -0.061962 0.993994	52.210648 16.623062 0.061845	7.1526E-07 1.1068E+01 1.1507E+01	LIFT
	31	55.330002 20.899979 0.0	57.116791 20.899979 0.0	51.496399 12.499992 0.0	50.059982 12.499992 0.0	0.0 0.0 1.000000	53.573639 16.623062 0.0	0.0 1.0971E+01 1.1437E+01	WAKE
3	1	50.059982 12.499992 0.0	48.623581 12.499992 -0.130353	43.832382 5.699999 -0.141352	45.389984 5.699999 0.0	0.090205 -0.061949 -0.993995	46.944550 9.054117 -0.067963	4.0233E-07 9.2219E+00 1.0241E+01	LIFT
	2	48.623581 12.499992 -0.130353	47.158493 12.499992 -0.258552	42.243591 5.699999 -0.280368	43.832382 5.699999 -0.141352	0.087011 -0.059699 -0.994417	45.431732 9.054082 -0.202767	1.6987E-06 9.3256E+00 1.0441E+01	
	3	47.158493 12.499992 -0.258552	44.127686 12.499992 -0.522850	38.957108 5.699999 -0.566966	42.243591 5.699999 -0.280368	0.086721 -0.059489 -0.994456	43.087692 9.054122 -0.407406	2.1905E-06 1.0658E+01 2.1598E+01	
	4	44.127686 12.499992 -0.522850	40.963989 12.499992 -0.794688	35.526489 5.699999 -0.861742	38.957108 5.699999 -0.566966	0.085462 -0.058531 -0.994621	39.858017 9.054117 -0.686936	1.0729E-06 1.0970E+01 2.2542E+01	
	5	40.963989 12.499992 -0.794688	37.656693 12.499992 -1.044980	31.940094 5.699999 -1.133154	35.526489 5.699999 -0.861742	0.075366 -0.050445 -0.995879	36.484177 9.054108 -0.959164	2.2352E-07 1.1304E+01 2.3536E+01	
	6	37.656693 12.499992 -1.044980	34.194992 12.499992 -1.245718	28.136295 5.699999 -1.350829	31.940094 5.699999 -1.133154	0.057854 -0.035700 -0.997687	32.954941 9.054112 -1.194322	6.7055E-07 1.1663E+01 2.4589E+01	
	7	34.194992 12.499992 -1.245718	30.568085 12.499992 -1.360271	24.253387 5.699999 -1.475046	28.186295 5.699999 -1.350829	0.031566 -0.012444 -0.999424	29.259109 9.054119 -1.358706	4.0233E-07 1.2047E+01 2.5718E+01	
	8	30.568085 12.499992 -1.360271	26.765182 12.499992 -1.349138	20.129578 5.699999 -1.462976	24.253387 5.699999 -1.475046	-0.002927 0.010503 -0.999804	25.385345 9.054112 -1.412629	2.2352E-07 1.2458E+01 2.6956E+01	
	9	26.765182 12.499992 -1.349138	22.768387 12.499992 -1.221299	15.795593 5.699999 -1.324348	20.129578 5.699999 -1.462976	-0.031933 0.047874 -0.998343	21.318771 9.054121 -1.340171	1.5367E-07 1.2906E+01 2.8372E+01	
	10	22.768387 12.499992 -1.221299	18.570480 12.499992 -0.937969	11.243500 5.699999 -1.017112	15.795593 5.699999 -1.324348	-0.067103 0.083875 -0.994214	17.046234 9.054118 -1.125796	1.0282E-06 1.3383E+01 2.9923E+01	

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
3	11	18.570430 12.499992 -0.937969	16.387207 12.499992 -0.691267	8.876000 5.699999 -0.749595	11.243500 5.699999 -1.017112	-0.111308 0.131399 -0.985061	13.719223 9.054111 -0.849448	4.4703E-07 1.1843E+01 1.5707E+01	LIFT
	12	16.387207 12.499992 -0.691267	15.277599 12.499992 -0.504895	7.672700 5.699999 -0.547496	8.876000 5.699999 -0.749595	-0.162684 0.188008 -0.968601	12.002323 9.054082 -0.623654	7.5996E-07 1.1055E+01 8.1188E+00	
	13	15.277599 12.499992 -0.504895	14.713795 12.499992 -0.367359	7.061399 5.699999 -0.398356	7.672700 5.699999 -0.547496	-0.228748 0.261698 -0.937650	11.129966 9.054173 -0.454774	4.9174E-06 1.0666E+01 4.2610E+00	
	14	14.713795 12.499992 -0.367359	14.376194 12.499992 -0.241674	6.695300 5.699999 -0.262066	7.061399 5.699999 -0.398356	-0.324282 0.368903 -0.871064	10.659925 9.054097 -0.317537	2.9001E-06 1.0514E+01 2.7467E+00	
	15	14.376194 12.499992 -0.241674	14.149990 12.499992 0.0	6.449999 5.699999 0.0	6.695300 5.699999 -0.262066	-0.562690 0.637163 -0.526691	10.365980 9.054114 -0.126004	1.1176E-06 1.0446E+01 3.0438E+00	
	16	14.149990 12.499992 0.0	14.376194 12.499992 0.241674	6.695300 5.699999 0.262066	6.449999 5.699999 0.0	-0.562690 0.637163 0.526691	10.365980 9.054114 0.126004	3.8892E-06 1.0446E+01 3.0438E+00	
	17	14.376194 12.499992 0.241674	14.713795 12.499992 0.367359	7.061399 5.699999 0.398356	6.695300 5.699999 0.262066	-0.324282 0.368903 0.871064	10.659924 9.054096 0.317537	1.0282E-06 1.0514E+01 2.7467E+00	
	18	14.713795 12.499992 0.367359	15.277599 12.499992 0.504895	7.672700 5.699999 0.547496	7.061399 5.699999 0.398356	-0.228748 0.261698 0.937650	11.129966 9.054173 0.454774	4.2915E-06 1.0666E+01 4.2610E+00	
	19	15.277599 12.499992 0.504895	16.387207 12.499992 0.691267	8.876000 5.699999 0.749595	7.672700 5.699999 0.547496	-0.162684 0.188008 0.968601	12.002323 9.054082 0.623654	4.5151E-06 1.1055E+01 8.1188E+00	
	20	16.387207 12.499992 0.691267	18.570480 12.499992 0.937969	11.243500 5.699999 1.017112	8.876000 5.699999 0.749595	-0.111308 0.131399 0.985061	13.719223 9.054111 0.849448	4.4703E-07 1.1843E+01 1.5707E+01	
	21	18.570430 12.499992 0.937969	22.768387 12.499992 1.221299	15.795593 5.699999 1.324348	11.243500 5.699999 1.017112	-0.067103 0.083875 0.994214	17.046234 9.054118 1.125796	0.0 1.3383E+01 2.9923E+01	
	22	22.768387 12.499992 1.221299	26.765182 12.499992 1.349138	20.129578 5.699999 1.462976	15.795593 5.699999 1.324348	-0.031933 0.047874 0.998343	21.318771 9.054121 1.340171	8.4937E-07 1.2906E+01 2.8372E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
3	23	26.765132 12.499992 1.349138	30.568085 12.499992 1.360269	24.253387 5.699999 1.475046	20.129578 5.699999 1.462976	-0.002926 0.019593 0.999804	25.385345 9.054112 1.412627	1.2517E-06 1.2458E+01 2.6956E+01	LIFT
	24	30.568085 12.499992 1.360269	34.194992 12.499992 1.245718	28.186295 5.699999 1.350827	24.253387 5.699999 1.475046	0.031566 -0.012444 0.999424	29.259109 9.054119 1.358706	1.2957E-06 1.2047E+01 2.5718E+01	
	25	34.194992 12.499992 1.245718	37.656693 12.499992 1.044980	31.940094 5.699999 1.133154	28.186295 5.699999 1.350827	0.057854 -0.035700 0.997687	32.954941 9.054112 1.194321	1.5199E-06 1.1663E+01 2.4589E+01	
	26	37.656693 12.499992 1.044980	40.963989 12.499992 0.794688	35.526489 5.699999 0.861742	31.940094 5.699999 1.133154	0.075366 -0.050445 0.995879	36.484177 9.054108 0.959164	1.3858E-06 1.1304E+01 2.3536E+01	
	27	40.963989 12.499992 0.794688	44.127686 12.499992 0.522850	38.957108 5.699999 0.566966	35.526489 5.699999 0.861742	0.085462 -0.058531 0.994621	39.858017 9.054117 0.686936	1.3411E-07 1.0970E+01 2.2542E+01	
	28	44.127686 12.499992 0.522850	47.158493 12.499992 0.253552	42.243591 5.699999 0.280368	38.957108 5.699999 0.566966	0.086721 -0.059489 0.994456	43.087692 9.054122 0.407406	3.5763E-07 1.0658E+01 2.1598E+01	
	29	47.158493 12.499992 0.253552	43.623581 12.499992 0.130353	43.832382 5.699999 0.141352	42.243591 5.699999 0.280368	0.087011 -0.059699 0.994417	45.431732 9.054082 0.202767	1.2070E-06 9.3256E+00 1.0441E+01	
	30	48.623581 12.499992 0.130353	50.059982 12.499992 0.0	45.389984 5.699999 0.0	43.832382 5.699999 0.141352	0.090205 -0.061049 0.993995	46.944550 9.054117 0.067963	2.2352E-07 9.2219E+00 1.0241E+01	
	31	50.059982 12.499992 0.0	51.496399 12.499992 0.0	46.947601 5.699999 0.0	45.389984 5.699999 0.0	0.0 0.0 1.000000	48.442383 9.054112 0.0	0.0 9.1394E+00 1.0180E+01	WAKE
4	1	45.339384 5.699999 0.0	43.832382 5.699999 -0.141352	39.811203 0.0 -0.150536	41.470001 0.0 0.0	0.090205 -0.062035 -0.993990	42.605057 2.820108 -0.072996	1.2517E-06 7.9772E+00 9.2222E+00	LIFT
	2	43.832382 5.699999 -0.141352	42.243591 5.699999 -0.280368	38.119186 0.0 -0.298584	39.811203 0.0 -0.150536	0.087009 -0.059780 -0.994412	40.980225 2.820111 -0.217782	8.0466E-07 8.0719E+00 9.4028E+00	
	3	42.243591 5.699999 -0.280368	38.957108 5.699999 -0.566966	34.619202 0.0 -0.603800	38.119186 0.0 -0.298584	0.086721 -0.059572 -0.994451	38.462585 2.820112 -0.437574	3.5763E-07 9.5250E+00 1.9449E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
4	4	39.957108 5.699999 -0.353966	35.526489 5.699999 -0.861742	30.965607 0.0 -0.917731	34.619202 0.0 -0.603800	0.085462 -0.058613 -0.994616	34.993744 2.820097 -0.737803	3.5763E-07 9.8223E+00 2.0299E+01	LIFT
	5	35.526489 5.699999 -0.861742	31.940094 5.699999 -1.133154	27.146301 0.0 -1.206779	30.965607 0.0 -0.917731	0.075368 -0.050523 -0.995876	31.370087 2.820125 -1.030190	3.2634E-06 1.0141E+01 2.1194E+01	
	6	31.940094 5.699999 -1.133154	28.186295 5.699999 -1.350829	23.148605 0.0 -1.438594	27.146301 0.0 -1.206779	0.057853 -0.035769 -0.997684	27.579529 2.820107 -1.282761	9.8348E-07 1.0482E+01 2.2143E+01	
	7	28.186295 5.699999 -1.350829	24.253387 5.699999 -1.475046	18.960083 0.0 -1.570883	23.148605 0.0 -1.438594	0.031566 -0.012510 -0.999424	23.609985 2.820098 -1.459319	2.6822E-07 1.0847E+01 2.3159E+01	
	8	24.253387 5.699999 -1.475046	20.129578 5.699999 -1.462976	14.568398 0.0 -1.558027	18.960083 0.0 -1.570883	-0.002927 0.019528 -0.999805	19.449387 2.820113 -1.517233	2.9895E-07 1.1238E+01 2.4274E+01	
	9	20.129578 5.699999 -1.462976	15.795593 5.699999 -1.324348	9.952799 0.0 -1.410394	14.568398 0.0 -1.558027	-0.031933 0.047804 -0.998346	15.081688 2.820106 -1.439410	4.3306E-07 1.1664E+01 2.5548E+01	
	10	15.795593 5.699999 -1.324348	11.243500 5.699999 -1.017112	5.104999 0.0 -1.083195	9.952799 0.0 -1.410394	-0.067104 0.083793 -0.994221	10.492810 2.820112 -1.209160	1.2070E-06 1.2118E+01 2.6945E+01	
	11	11.243500 5.699999 -1.017112	8.876000 5.699999 -0.749595	2.583599 0.0 -0.798298	5.104999 0.0 -1.083195	-0.111307 0.131292 -0.985075	6.919413 2.820093 -0.912350	2.4140E-06 1.0370E+01 1.4144E+01	
	12	8.876000 5.699999 -0.749595	7.672700 5.699999 -0.547496	1.302200 0.0 -0.583068	2.583599 0.0 -0.798298	-0.162689 0.187873 -0.968626	5.075452 2.820136 -0.669335	3.3528E-06 9.4805E+00 7.3108E+00	
	13	7.672700 5.699999 -0.547496	7.061399 5.699999 -0.399356	0.651100 0.0 -0.424238	1.302200 0.0 -0.583068	-0.228757 0.261520 -0.937698	4.138274 2.820052 -0.488451	4.8280E-06 9.0448E+00 3.8369E+00	
	14	7.061399 5.699999 -0.399356	6.695300 5.699999 -0.262066	0.261300 0.0 -0.279093	0.651100 0.0 -0.424238	-0.324336 0.368706 -0.871127	3.633697 2.820199 -0.341050	8.2254E-06 8.8739E+00 2.4730E+00	
	15	6.695300 5.699999 -0.262066	6.449999 5.699999 0.0	0.0 0.0 0.0	0.261300 0.0 -0.279093	-0.562828 0.636881 -0.526885	3.317806 2.820056 -0.135334	5.2750E-06 8.7069E+00 2.7403E+00	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

*

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
4	16	6.449999 5.699999 0.0	6.695300 5.699999 0.262066	0.261300 0.0 0.279093	0.0 0.0 0.0	-0.562828 0.636881 0.526885	3.317806 2.820056 0.135334	1.1176E-05 8.7969E+00 2.7403E+00	LIFT
	17	6.695300 5.699999 0.262066	7.061399 5.699999 0.398356	0.651100 0.0 0.424238	0.261300 0.0 0.279093	-0.324336 0.368706 0.871127	3.633697 2.820199 0.341050	5.5432E-06 8.8739E+00 2.4730E+00	
	18	7.061399 5.699999 0.398356	7.672700 5.699999 0.547496	1.302200 0.0 0.583068	0.651100 0.0 0.424238	-0.228757 0.261520 0.937698	4.138274 2.820052 0.488451	4.6045E-06 9.0449E+00 3.8369E+00	
	19	7.672700 5.699999 0.547496	8.876000 5.699999 0.749595	2.583499 0.0 0.798298	1.302200 0.0 0.583068	-0.162695 0.187981 0.968623	5.075466 2.820173 0.669335	6.4373E-06 9.4905E+00 7.3105E+00	
	20	8.876000 5.699999 0.749595	11.243500 5.699999 1.017112	5.104999 0.0 1.083196	2.583499 0.0 0.798298	-0.111305 0.131290 0.985076	6.919363 2.820075 0.912350	5.0962E-06 1.0370E+01 1.4145E+01	
	21	11.243500 5.699999 1.017112	15.795593 5.699999 1.324348	9.952799 0.0 1.410394	5.104999 0.0 1.083196	-0.067104 0.083793 0.994222	10.492810 2.820112 1.209161	4.0223E-07 1.2118E+01 2.6945E+01	
	22	15.795593 5.699999 1.324348	20.129578 5.699999 1.462976	14.568398 0.0 1.558027	9.952799 0.0 1.410394	-0.031933 0.047804 0.998346	15.081688 2.820106 1.439410	1.3411E-07 1.1664E+01 2.5548E+01	
	23	20.129578 5.699999 1.462976	24.253387 5.699999 1.475046	18.960083 0.0 1.570883	14.568398 0.0 1.558027	-0.002927 0.019528 0.999805	19.449387 2.820113 1.517232	6.7055E-07 1.1238E+01 2.4274E+01	
	24	24.253387 5.699999 1.475046	28.186295 5.699999 1.350827	23.148605 0.0 1.438594	18.960083 0.0 1.570883	0.031566 -0.012510 0.999424	23.609995 2.820098 1.459319	7.9628E-07 1.0847E+01 2.3159E+01	
	25	28.186295 5.699999 1.350827	31.940094 5.699999 1.133154	27.146301 0.0 1.206777	23.148605 0.0 1.438594	0.057854 -0.035769 0.997684	27.579529 2.820107 1.282760	1.3411E-07 1.0482E+01 2.2143E+01	
	26	31.940094 5.699999 1.133154	35.526489 5.699999 0.861742	30.965607 0.0 0.917731	27.146301 0.0 1.206777	0.075367 -0.050523 0.995876	31.370087 2.820125 1.030189	1.1623E-06 1.0141E+01 2.1194E+01	
	27	35.526489 5.699999 0.861742	38.957108 5.699999 0.566966	34.619202 0.0 0.603800	30.965607 0.0 0.917731	0.085462 -0.058613 0.994616	34.993744 2.820097 0.737803	1.5646E-06 9.8223E+00 2.0299E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
4	28	38.357108 5.699999 0.565966	42.243591 5.699999 0.280368	38.119186 0.0 0.298584	34.619202 0.0 0.603800	0.086721 -0.059572 0.994451	38.462585 2.820112 0.437574	1.3411E-07 9.5250E+00 1.9449E+01	LIFT
	29	42.243591 5.699999 0.280368	43.832382 5.699999 0.141352	39.811203 0.0 0.150536	38.119186 0.0 0.298584	0.087009 -0.059780 0.994412	40.980225 2.820111 0.217782	4.9174E-07 8.0719E+00 9.4028E+00	
	30	43.832382 5.699999 0.141352	45.389984 5.699999 0.0	41.470001 0.0 0.0	39.811203 0.0 0.150536	0.090205 -0.062035 0.993990	42.605057 2.820108 0.072996	1.3411E-06 7.9772E+00 9.2222E+00	
	31	45.389984 5.699999 0.0	46.947601 5.699999 0.0	43.128799 0.0 0.0	41.470001 0.0 0.0	0.0 0.0 1.000000	44.213791 2.820111 0.0	0.0 7.9053E+00 9.1668E+00	WAKE

********** ********** **********

FINISH THE FORMATION OF ELEMENTS. TIME IS 1.072 SEC.

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

TABLE OF INPUT INFORMATION

INPUT SECTION NO.	SECTION TYPE	TOTAL NO. OF ELEMENTS IN EACH SECTION	EXTRA STRIPS	STRIP NO.	SOURCE ELEMENTS IN THE STRIP	WAKE ELEMENTS IN THE STRIP
1	1	124	0	1	30	1
				2	30	1
				3	30	1
				4	30	1

TOTAL NO. OF ELEMENTS INPUT = 124

END OF THE SUBROUTINE INPUT . TIME IS 1.168 SEC.

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

---------- * ----------

BEGINNING THE VFORM ROUTINE TIME IS 1.17 SEC

---------- * ----------

BODY SECTION NO. = 1 TYPE = 1 TOTAL NO. OF POINTS = 124 NO. OF STRIPS = 4

LIFTING SECTION NO. 1 NO. OF SOURCE ELEMENTS 30

NO. OF WAKE ELEMENTS 1 TOTAL NO. OF ELEMENTS PER STRIP 31

TOTAL NO. OF CONTROL POINTS (INCL. OFF BODY POINTS) = 120

LIFTING STRIP NO. 1, NO. OF IGNORE ELEMENTS 0

LIFTING STRIP NO. 2, NO. OF IGNORE ELEMENTS 0

LIFTING STRIP NO. 3, NO. OF IGNORE ELEMENTS 0

LIFTING STRIP NO. 4, NO. OF IGNORE ELEMENTS 0

TOTAL NO. OF ELEMENTS IN THE LIFTING SECTION = 124

TIME FOR THE FORMATION OF THE LIFTING VELOCITY MATRIX = 0.33MIN

NO. OF FAR ELEMENTS = 2230 NO. OF INTERMEDIATE ELEMENTS = 10296 NO. OF NEAR ELEMENTS = 17234

END OF THE VFORM ROUTINE TIME IS 20.75 SEC

END OF THE AFORM ROUTINE TIME IS 21.07 SEC

THE 120 X 120 MATRIX WITH 5 RIGHT SIDES WAS SOLVED DIRECTLY IN 0.042MINUTES.

I-ARRAY

-0.68838E-02-0.78109E-02-0.76385E-02-0.72685E-02

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

FINAL OUTPUT FOR THE FOLLOWING ANGLE OF ATTACK

(0.989707, 0.0 , 0.143106)

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	1	58.534885 25.776428 -0.054459	0.916392 0.073012 0.078588	0.922649 0.851281 0.148719	0.993218 0.079133 0.085176	0.090204 -0.062060 -0.993988	0.068020 0.000016 12.052448
	2	57.372711 25.776474 -0.162476	0.939438 0.063148 0.078393	0.944815 0.892676 0.107324	0.994308 0.066836 0.082971	0.087012 -0.059807 -0.994410	0.068394 0.000011 12.288094
	3	55.494370 25.776413 -0.326453	0.958668 0.060140 0.080050	0.963882 0.929069 0.070931	0.994590 0.062394 0.083049	0.086719 -0.059595 -0.994449	0.068508 -0.000055 25.419083
	4	52.906448 25.776428 -0.550439	0.978731 0.061142 0.080505	0.983938 0.968133 0.031867	0.994708 0.062140 0.081819	0.085462 -0.059637 -0.994615	0.068023 -0.000012 26.528748
	5	50.203033 25.776443 -0.768573	0.994638 0.064836 0.071991	0.999345 0.998691 0.001309	0.995290 0.064878 0.072038	0.075367 -0.059544 -0.995874	0.069050 -0.000008 27.697723
	6	47.375092 25.776443 -0.957004	1.006310 0.069614 0.055858	1.010259 1.020623 -0.020623	0.996091 0.068907 0.055291	0.057853 -0.059784 -0.997684	0.072219 -0.000002 28.938980
	7	44.413589 25.776413 -1.088724	1.009902 0.077535 0.030929	1.013346 1.026869 -0.026869	0.996602 0.076514 0.030522	0.031566 -0.059516 -0.999423	0.078263 -0.000003 30.266739
	8	41.309601 25.776459 -1.131930	0.997555 0.095054 -0.001059	1.002073 1.004151 -0.004151	0.995491 0.094857 -0.001057	-0.002927 0.059534 -0.999805	0.088187 -0.000004 31.723709
	9	38.051025 25.776428 -1.073872	0.972076 0.117391 -0.025467	0.979469 0.959360 0.040640	0.992451 0.119852 -0.026001	-0.031933 0.047821 -0.998346	0.100318 -0.000002 33.389236
	10	34.627487 25.776413 -0.902095	0.912186 0.161255 -0.047967	0.927570 0.860386 0.139614	0.983414 0.173846 -0.051713	-0.067104 0.083824 -0.994219	0.116231 -0.000004 35.214935
	11	31.961624 25.776474 -0.680659	0.829538 0.235302 -0.062623	0.863994 0.746485 0.253515	0.960121 0.270028 -0.072481	-0.111306 0.131340 -0.985069	0.130337 -0.000003 18.485550

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	12	30.585846	0.725772	0.804042	0.902654	-0.162682	0.140081
		25.776443	0.341533	0.646483	0.424770	0.187935	-0.000004
		-0.499731	-0.055626	0.353517	-0.069183	-0.968615	9.554810
	13	29.886734	0.595787	0.767672	0.776096	-0.228777	0.145148
		25.776428	0.483996	0.589321	0.630472	0.261641	-0.000008
		-0.364409	-0.010304	0.410679	-0.013422	-0.937659	5.013977
	14	29.510330	0.429241	0.804860	0.533311	-0.324309	0.145218
		25.776535	0.669520	0.647800	0.831946	0.368814	-0.000010
		-0.254440	0.123674	0.352200	0.153659	-0.871091	3.232256
	15	29.274643	0.214323	1.277088	0.167822	-0.562733	0.140503
		25.776428	0.909373	1.630955	0.712068	0.637013	-0.000014
		-0.100966	0.870667	-0.630955	0.681760	-0.526826	3.581857
	16	29.274643	1.199635	1.956298	0.613217	-0.562733	-0.025853
		25.776428	-0.206794	3.827103	-0.105707	0.637013	-0.000018
		0.100966	1.531410	-2.827103	0.782810	0.526826	3.581857
	17	29.510330	1.487316	1.762028	0.844093	-0.324309	-0.094674
		25.776535	-0.533623	3.104740	-0.302846	0.368814	0.000003
		0.254440	0.779666	-2.104740	0.442482	0.871091	3.232257
	18	29.886734	1.409311	1.550751	0.908793	-0.228777	-0.108126
		25.776428	-0.446384	2.404828	-0.287951	0.261641	0.000003
		0.364409	0.468415	-1.404828	0.302057	0.937659	5.013977
	19	30.585846	1.326899	1.403769	0.945240	-0.162682	-0.112815
		25.776443	-0.353505	1.970569	-0.251826	0.187935	0.000006
		0.499731	0.291452	-0.970569	0.207621	0.968615	9.554810
	20	31.961624	1.256506	1.227894	0.968037	-0.111306	-0.111176
		25.776474	-0.272377	1.684787	-0.209845	0.131340	0.000007
		0.680659	0.178300	-0.684787	0.137366	0.985069	18.485550
	21	34.627487	1.201294	1.222343	0.982779	-0.067104	-0.104200
		25.776413	-0.203389	1.494123	-0.166393	0.083824	0.000007
		0.902095	0.098235	-0.494123	0.080366	0.994219	35.214935
	22	38.051025	1.152101	1.162523	0.991034	-0.031933	-0.093609
		25.776428	-0.148966	1.351460	-0.128140	0.047821	0.000005
		1.073872	0.043991	-0.351460	0.037841	0.998346	33.389236

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	23	41.309601 25.776459 1.131930	1.118540 -0.125224 0.005722	1.125542 1.266844 -0.266844	0.993779 -0.111257 0.005084	-0.002927 0.019534 0.999805	-0.085860 0.000001 31.723709
	24	44.413605 25.776428 1.088651	1.085416 -0.106340 -0.035669	1.091105 1.190707 -0.190707	0.994704 -0.097453 -0.032688	0.031615 -0.012546 0.999421	-0.082698 0.000001 30.266861
	25	47.375076 25.776428 0.956930	1.052357 -0.088021 -0.064120	1.057976 1.119313 -0.119313	0.994689 -0.083198 -0.060606	0.057801 -0.035725 0.997689	-0.081499 -0.000000 28.938934
	26	50.203033 25.776443 0.768573	1.020782 -0.070364 -0.080857	1.026434 1.053567 -0.053567	0.994493 -0.069137 -0.078775	0.075367 -0.050544 0.995874	-0.081321 -0.000003 27.697723
	27	52.906448 25.776428 0.550439	0.991128 -0.054904 -0.088409	0.996576 0.993165 0.006835	0.994532 -0.055003 -0.088713	0.085462 -0.038637 0.994615	-0.081797 -0.000009 26.528748
	28	55.494370 25.776413 0.326453	0.966734 -0.041527 -0.086824	0.971513 0.943837 0.056163	0.995081 -0.042744 -0.089369	0.086719 -0.059595 0.994449	-0.081984 -0.000033 25.419083
	29	57.372711 25.776474 0.162476	0.945696 -0.028091 -0.084440	0.949874 0.902260 0.097740	0.995602 -0.029574 -0.088895	0.087012 -0.055807 0.994410	-0.081518 -0.000001 12.288094
	30	58.584885 25.776428 0.054459	0.918626 -0.009087 -0.083918	0.922496 0.850998 0.149002	0.995805 -0.009850 -0.090969	0.090204 -0.062060 0.993988	-0.081126 0.000014 12.052448

THE FORCE COMPONENTS OF THIS STRIP ARE -0.133479E+02 0.154750E+02 0.102994E+03

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.264768E+04 -0.361015E+04 0.826453E+03

2	1	52.210648 16.623062 -0.061845	0.923526 0.083785 0.078634	0.930647 0.866103 0.133897	0.992349 0.090028 0.084494	0.090204 -0.061962 -0.993994	0.078107 -0.000047 11.506591

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	2	50.834076	0.944490	0.950387	0.993795	0.087014	0.076486
		16.623062	0.070935	0.903235	0.074638	-0.059713	0.000015
		-0.184512	0.078371	0.096765	0.082462	-0.994416	11.731304
	3	48.701050	0.963384	0.968587	0.994629	0.086720	0.074999
		16.623077	0.059878	0.938160	0.061820	-0.059500	0.000017
		-0.370727	0.080410	0.061840	0.083018	-0.994455	24.267700
	4	45.762115	0.981192	0.935797	0.995328	0.085462	0.072568
		16.623062	0.049259	0.971796	0.049969	-0.058542	-0.000028
		-0.625091	0.081437	0.028204	0.082610	-0.994620	25.327362
	5	42.692001	0.993956	0.997492	0.996455	0.075367	0.071758
		16.623047	0.041130	0.994990	0.041233	-0.050458	-0.000009
		-0.872811	0.073147	0.005010	0.073331	-0.995879	26.443405
	6	39.480560	1.001364	1.003615	0.997756	0.057854	0.073123
		16.623077	0.035957	1.007244	0.035827	-0.035710	-0.000004
		-1.086797	0.056783	-0.007244	0.056579	-0.997686	27.628036
	7	36.117416	0.999412	1.000609	0.998804	0.031566	0.077311
		16.623062	0.037806	1.001220	0.037783	-0.012456	-0.000002
		-1.236382	0.031097	-0.001220	0.031078	-0.999424	28.896103
	8	32.592407	0.980649	0.982187	0.998433	-0.002927	0.085189
		16.623062	0.054933	0.964692	0.055029	0.019580	-0.000003
		-1.285449	-0.001792	0.035308	-0.001824	-0.999804	30.286697
	9	28.891937	0.949765	0.953888	0.995678	-0.031933	0.094945
		16.623062	0.084590	0.909902	0.088679	0.047858	-0.000003
		-1.219516	-0.026321	0.090098	-0.027594	-0.998344	31.877411
	10	25.004059	0.893571	0.905989	0.986293	-0.067103	0.108533
		16.623062	0.141448	0.820817	0.156125	0.083854	-0.000002
		-1.024441	-0.048377	0.179183	-0.053397	-0.994216	33.620590
	11	21.976593	0.821001	0.851742	0.963908	-0.111308	0.121630
		16.623077	0.217622	0.725465	0.255502	0.131372	-0.000005
		-0.772973	-0.063742	0.274535	-0.074837	-0.985065	17.648071
	12	20.414337	0.726112	0.796586	0.911529	-0.162686	0.131422
		16.623093	0.322148	0.634550	0.404411	0.197972	-0.000005
		-0.567506	-0.059434	0.365450	-0.074611	-0.968607	9.121888

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	13	19.620255 16.622971 -0.413832	0.603619 0.459181 -0.019118	0.758662 0.575569 0.424431	0.795636 0.605250 -0.025200	-0.228752 0.261651 -0.937663	0.137057 -0.000007 4.787437
	14	19.192657 16.623016 -0.288950	0.445443 0.637014 0.103920	0.784222 0.615005 0.384995	0.568006 0.812287 0.132513	-0.324310 0.368867 -0.871068	0.137839 -0.000009 3.085860
	15	18.925339 16.623154 -0.114660	0.232384 0.876509 0.811847	1.217113 1.481365 -0.481365	0.190931 0.720154 0.667026	-0.562718 0.637079 -0.526762	0.135433 -0.000011 3.419737
	16	18.925339 16.623154 0.114660	1.170139 -0.184517 1.473157	1.890361 3.573462 -2.573462	0.619003 -0.097610 0.779299	-0.562718 0.637079 0.526762	-0.021226 -0.000007 3.419737
	17	19.192657 16.623016 0.288950	1.459411 -0.512432 0.760360	1.723546 2.970613 -1.970613	0.846749 -0.297313 0.441160	-0.324310 0.368867 0.871068	-0.087602 0.000004 3.085860
	18	19.620255 16.622971 0.413832	1.389009 -0.433563 0.459850	1.526036 2.328786 -1.328786	0.910207 -0.284111 0.301336	-0.228752 0.261651 0.937663	-0.099987 0.000004 4.787437
	19	20.414337 16.623093 0.567506	1.313533 -0.348703 0.288298	1.389272 1.930077 -0.930077	0.945483 -0.250997 0.207517	-0.162686 0.187972 0.968607	-0.104071 0.000007 9.121888
	20	21.976593 16.623077 0.772973	1.250404 -0.276959 0.178234	1.293052 1.671984 -0.671984	0.967018 -0.214190 0.137840	-0.111308 0.131372 0.985065	-0.102273 0.000007 17.648071
	21	25.004059 16.623062 1.024441	1.202502 -0.220513 0.099765	1.226617 1.504590 -0.504590	0.980341 -0.179774 0.081333	-0.067103 0.083854 0.994216	-0.096299 0.000006 33.620605
	22	28.891937 16.623062 1.219516	1.165568 -0.180261 0.045928	1.180318 1.393151 -0.393151	0.987504 -0.152723 0.038911	-0.031933 0.047858 0.998344	-0.088540 0.000005 31.877411
	23	32.592407 16.623062 1.285449	1.141855 -0.158619 0.006455	1.152838 1.329034 -0.329034	0.990473 -0.137590 0.005599	-0.002926 0.019590 0.999804	-0.083690 0.000006 30.286697

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	24	36.117416 16.623062 1.236382	1.112607 -0.135215 -0.036824	1.121397 1.257532 -0.257532	0.992162 -0.120578 -0.032837	0.031566 -0.012455 0.999424	-0.082896 0.000002 28.896103
	25	39.480560 16.623077 1.086797	1.079165 -0.110163 -0.066520	1.086810 1.181157 -0.181157	0.992966 -0.101363 -0.061207	0.057854 -0.035710 0.997686	-0.083563 0.000001 27.628036
	26	42.692001 16.623047 0.872811	1.045116 -0.085958 -0.083451	1.051960 1.106620 -0.106620	0.993494 -0.081712 -0.079329	0.075367 -0.050458 0.995879	-0.084928 -0.000002 26.443405
	27	45.762115 16.623062 0.625091	1.011614 -0.062998 -0.090637	1.017617 1.035545 -0.035545	0.994101 -0.061907 -0.089068	0.085462 -0.059542 0.994620	-0.086893 -0.000007 25.327362
	28	48.701050 16.623077 0.370727	0.982717 -0.044006 -0.088317	0.987658 0.975468 0.024532	0.994997 -0.044555 -0.089421	0.086720 -0.059500 0.994455	-0.088694 0.000011 24.267700
	29	50.834076 16.623062 0.184512	0.958132 -0.027782 -0.085502	0.962347 0.926111 0.073889	0.995621 -0.029076 -0.088847	0.087014 -0.059713 0.994416	-0.089670 0.000018 11.731304
	30	52.210648 16.623062 0.061845	0.926582 -0.006921 -0.084549	0.930456 0.865748 0.134252	0.995836 -0.007331 -0.090868	0.090204 -0.061962 0.993994	-0.091222 -0.000037 11.506591

************ ************ ************

THE FORCE COMPONENTS OF THIS STRIP ARE -0.110218E+02 0.130466E+02 0.113044E+03

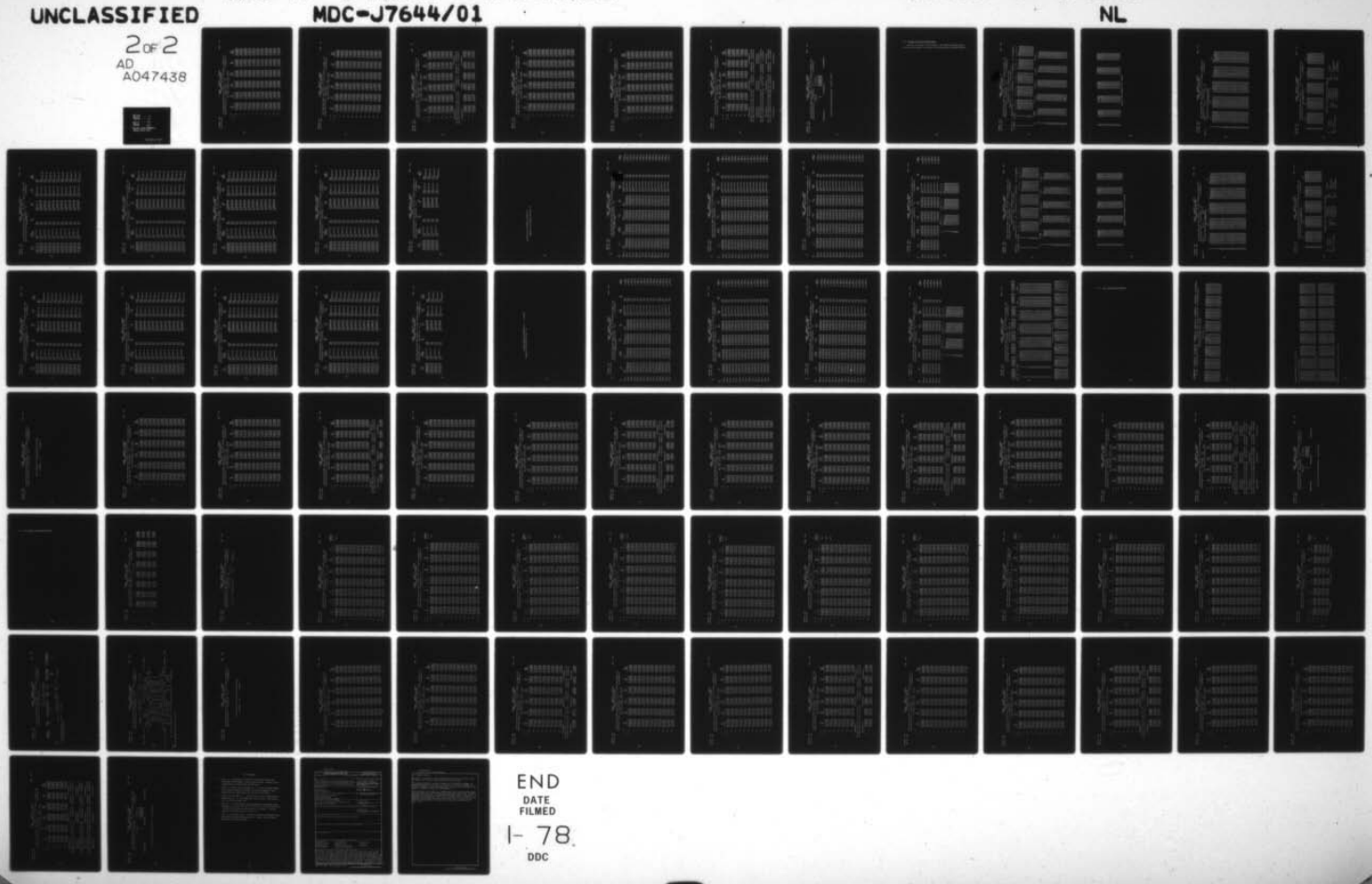
THE MOMENT COMPONENTS OF THIS STRIP ARE 0.187134E+04 -0.303654E+04 0.453169E+03

************ ************ ************

3	1	46.944550 9.054117 -0.067963	0.928310 0.078344 0.079377	0.934985 0.874197 0.125803	0.992860 0.083791 0.084897	0.090205 -0.061949 -0.993995	0.076874 -0.000016 10.241095
	2	45.431732 9.054082 -0.202767	0.946809 0.063982 0.078999	0.952251 0.906782 0.093218	0.994285 0.067191 0.082961	0.087011 -0.059699 -0.994417	0.073348 0.000005 10.441466

AD-A047 438 DOUGLAS AIRCRAFT CO LONG BEACH CALIF F/G 20/4
USER'S MANUAL FOR A FULLY AUTOMATIC THREE-DIMENSIONAL POTENTIAL--ETC(U)
AUG 77 D MACK, S M SCHIMKE N00014-74-C-0059
UNCLASSIFIED MDC-J7644/01 NL

2 OF 2
AD
A047438



END
DATE
FILMED
1-78
DDC

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	3	43.087692	0.964687	0.969320	0.995221	0.086721	0.070456
		9.054122	0.048617	0.939581	0.050156	-0.059489	0.000006
		-0.407406	0.081211	0.060419	0.083781	-0.994456	21.598480
	4	39.858017	0.980855	0.984877	0.995917	0.085462	0.066631
		9.054117	0.033614	0.969982	0.034130	-0.058531	-0.000009
		-0.686936	0.082311	0.030018	0.083575	-0.994621	22.541809
	5	36.434177	0.992389	0.995398	0.996977	0.075366	0.064598
		9.054108	0.022622	0.990817	0.022726	-0.050445	-0.000005
		-0.959164	0.073962	0.009183	0.074304	-0.995879	23.535599
	6	32.954941	0.998661	1.000436	0.998226	0.057854	0.064774
		9.054112	0.016189	1.000873	0.016182	-0.035700	-0.000004
		-1.194322	0.057335	-0.000873	0.057310	-0.997687	24.589462
	7	29.259109	0.995937	0.996585	0.999350	0.031566	0.067707
		9.054119	0.017726	0.993181	0.017787	-0.012444	-0.000004
		-1.358706	0.031239	0.006819	0.031346	-0.999424	25.718033
	8	25.385345	0.977407	0.978011	0.999382	-0.002927	0.074097
		9.054112	0.034320	0.956506	0.035091	0.019593	-0.000004
		-1.412629	-0.002185	0.043494	-0.002234	-0.999804	26.956055
	9	21.318771	0.947539	0.950020	0.997389	-0.031933	0.082027
		9.054121	0.062952	0.902538	0.066264	0.047874	-0.000003
		-1.340171	-0.027286	0.097462	-0.028721	-0.998343	28.371597
	10	17.046234	0.895915	0.904923	0.990046	-0.067103	0.093455
		9.054118	0.116879	0.818885	0.129159	0.083875	-0.000003
		-1.125796	-0.050605	0.191115	-0.055922	-0.994214	29.923050
	11	13.719223	0.833070	0.856685	0.972434	-0.111308	0.105051
		9.054111	0.187419	0.733909	0.218773	0.131399	-0.000006
		-0.849448	-0.069127	0.266091	-0.080691	-0.985061	15.707233
	12	12.002323	0.751115	0.804846	0.933241	-0.162684	0.114277
		9.054082	0.280090	0.647777	0.348004	0.188008	-0.000005
		-0.623654	-0.071785	0.352223	-0.089191	-0.968601	8.118799
	13	11.129966	0.643669	0.760002	0.846931	-0.228748	0.120126
		9.054173	0.401588	0.577603	0.528404	0.261698	-0.000004
		-0.454774	-0.044941	0.422397	-0.059133	-0.937650	4.260993

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

CN - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	V VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	14	10.659925	0.502087	0.755188	0.664850	-0.324282	0.122135
		9.054097	0.561797	0.570309	0.743916	0.368903	-0.000007
		-0.317537	0.051015	0.429691	0.067553	-0.871064	2.746725
	15	10.365980	0.287847	1.082706	0.265859	-0.562690	0.124296
		9.054114	0.804181	1.172254	0.742751	0.637163	-0.000008
		-0.126004	0.665350	-0.172254	0.614525	-0.526691	3.043807
	16	10.365980	1.103607	1.725070	0.639746	-0.562690	-0.010892
		9.054114	-0.117068	2.975866	-0.067863	0.637163	0.000014
		0.126004	1.320687	-1.975866	0.765585	0.526691	3.043809
	17	10.659924	1.387582	1.615253	0.859049	-0.324282	-0.072021
		9.054096	-0.437257	2.609045	-0.270705	0.368903	0.000006
		0.317537	0.701761	-1.609045	0.434459	0.871064	2.746725
	18	11.129966	1.332725	1.449490	0.919444	-0.229748	-0.083267
		9.054173	-0.374510	2.101020	-0.258373	0.261698	0.000005
		0.454774	0.429662	-1.101020	0.296423	0.937650	4.260993
	19	12.002223	1.271907	1.335904	0.952094	-0.162684	-0.086931
		9.054082	-0.304203	1.784640	-0.227713	0.188008	0.000008
		0.623654	0.272681	-0.784640	0.204117	0.969601	8.118799
	20	13.719223	1.221969	1.257822	0.971496	-0.111308	-0.085555
		9.054111	-0.244486	1.582117	-0.194372	0.131399	0.000008
		0.849448	0.170698	-0.582117	0.135709	0.985061	15.707233
	21	17.046234	1.186468	1.206810	0.983144	-0.067103	-0.081135
		9.054118	-0.199273	1.456390	-0.164295	0.083875	0.000008
		1.125796	0.096813	-0.456390	0.080222	0.994214	29.923050
	22	21.318771	1.162002	1.174724	0.989170	-0.031933	-0.075752
		9.054121	-0.166409	1.379976	-0.141658	0.047874	0.000007
		1.340171	0.045154	-0.379976	0.038438	0.999343	28.371597
	23	25.385345	1.146157	1.155946	0.991532	-0.002926	-0.072864
		9.054112	-0.149989	1.336211	-0.129754	0.019593	0.000005
		1.412627	0.006299	-0.336211	0.005449	0.999804	26.956055
	24	29.259109	1.122482	1.130775	0.992666	0.031566	-0.073670
		9.054119	-0.131574	1.278652	-0.116358	-0.012444	0.000006
		1.358706	-0.037085	-0.278652	-0.032796	0.999424	25.718033

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	25	32.954941 9.054112 1.194321	1.091960 -0.110683 -0.067276	1.099614 1.209151 -0.209151	0.993039 -0.100656 -0.061181	0.057854 -0.035700 0.997687	-0.075660 0.000005 24.589478
	26	36.484177 9.054108 0.959164	1.058513 -0.089377 -0.084626	1.065644 1.135598 -0.135598	0.993308 -0.083871 -0.079413	0.075366 -0.050445 0.995879	-0.078214 0.000007 23.535599
	27	39.859017 9.054117 0.686936	1.023620 -0.067701 -0.091933	1.029966 1.060831 -0.060831	0.993838 -0.065731 -0.089258	0.085462 -0.058531 0.994621	-0.081332 0.000005 22.541809
	28	43.087692 9.054122 0.407406	0.991908 -0.048112 -0.089362	0.997087 0.994182 0.005818	0.994806 -0.048252 -0.089623	0.086721 -0.059489 0.994456	-0.084409 0.000015 21.598480
	29	45.431732 9.054082 0.202767	0.965412 -0.031174 -0.086323	0.969765 0.940445 0.059555	0.995511 -0.032146 -0.089015	0.087011 -0.059699 0.994417	-0.086700 0.000021 10.441466
	30	46.944550 9.054117 0.067963	0.930872 -0.008408 -0.085001	0.934782 0.873818 0.126182	0.995817 -0.008994 -0.090932	0.090205 -0.061949 0.993995	-0.090105 -0.000001 10.241095

********** ********** **********

THE FORCE COMPONENTS OF THIS STRIP ARE -0.703907E+01 0.853740E+01 0.980380E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.880877E+03 -0.196755E+04 0.168612E+03

********** ********** **********

4	1	42.605057 2.820108 -0.072996	0.933814 0.064379 0.080730	0.939505 0.882670 0.117330	0.993942 0.068525 0.085929	0.090205 -0.062035 -0.993990	0.073375 -0.000005 9.222164
	2	40.980225 2.820111 -0.217782	0.952070 0.050701 0.080264	0.956792 0.915450 0.084550	0.995065 0.052991 0.083888	0.087009 -0.059780 -0.994412	0.067416 -0.000008 9.402838
	3	38.462585 2.820112 -0.437574	0.971697 0.037738 0.082486	0.975921 0.952422 0.047578	0.995671 0.039669 0.084521	0.086721 -0.059572 -0.994451	0.062777 -0.000009 19.449326

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

CN - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	4	34.993744 2.820097 -0.737803	0.986444 0.028116 0.083110	0.990338 0.980769 0.019231	0.996068 0.028390 0.083920	0.085462 -0.058613 -0.994616	0.057366 -0.000007 20.299210
	5	31.370087 2.820125 -1.030190	0.995760 0.021843 0.074252	0.998763 0.997528 0.002472	0.996993 0.021870 0.074344	0.075368 -0.050523 -0.995876	0.054039 -0.000001 21.193649
	6	27.579529 2.820107 -1.282761	0.999153 0.019067 0.057257	1.000974 1.001947 -0.001947	0.998181 0.019048 0.057201	0.057853 -0.035769 -0.997684	0.052949 -0.000002 22.142944
	7	23.609985 2.820098 -1.459319	0.993205 0.022150 0.031097	0.993938 0.987913 0.012087	0.999262 0.022285 0.031287	0.031566 -0.012510 -0.999424	0.054435 -0.000005 23.159302
	8	19.449387 2.820113 -1.517233	0.972007 0.036327 -0.002131	0.972688 0.946122 0.053878	0.999300 0.037347 -0.002191	-0.002927 0.019528 -0.999805	0.058949 -0.000005 24.273834
	9	15.081698 2.820106 -1.439410	0.940946 0.057527 -0.027338	0.943099 0.889436 0.110564	0.997717 0.060998 -0.028987	-0.031933 0.047804 -0.998346	0.064446 -0.000005 25.548492
	10	10.492810 2.820112 -1.209160	0.893957 0.096896 -0.052166	0.900705 0.811270 0.188730	0.992508 0.107577 -0.057916	-0.067104 0.083793 -0.994221	0.072622 -0.000005 26.945343
	11	6.919413 2.820093 -0.912350	0.840869 0.150407 -0.074961	0.857498 0.735302 0.264698	0.980608 0.175403 -0.087419	-0.111307 0.131292 -0.985075	0.081462 -0.000005 14.144451
	12	5.075452 2.820136 -0.669835	0.776622 0.221521 -0.087469	0.812320 0.659864 0.340136	0.956054 0.272701 -0.107678	-0.162689 0.187873 -0.968626	0.089361 -0.000006 7.310763
	13	4.138274 2.820052 -0.488451	0.690777 0.317071 -0.080085	0.764277 0.584120 0.415880	0.903830 0.414864 -0.104785	-0.228757 0.261520 -0.937698	0.095263 -0.000005 3.836887
	14	3.633697 2.820199 -0.341050	0.573556 0.449268 -0.023383	0.728941 0.531355 0.468645	0.786835 0.616330 -0.032079	-0.324336 0.368706 -0.871127	0.098736 -0.000007 2.473024

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	15	3.317806 2.820056 -0.135334	0.360338 0.691953 0.451502	0.901386 0.812496 0.187504	0.399760 0.767655 0.500898	-0.562828 0.636881 -0.526985	0.107359 -0.000006 2.740273
	16	3.317806 2.820056 0.135334	0.997601 -0.022242 1.092566	1.479663 2.189403 -1.189403	0.674208 -0.015032 0.738389	-0.562828 0.636881 0.526985	0.003618 0.000014 2.740273
	17	3.633697 2.820199 0.341050	1.273402 -0.327331 0.612665	1.450537 2.104056 -1.104056	0.877883 -0.225662 0.422372	-0.324336 0.368706 0.871127	-0.049773 0.000010 2.473024
	18	4.138274 2.820052 0.488451	1.242879 -0.286748 0.383187	1.331841 1.773803 -0.773803	0.933203 -0.215302 0.287712	-0.228757 0.261520 0.937698	-0.059426 0.000006 3.836887
	19	5.075466 2.820173 0.669835	1.205197 -0.235455 0.248109	1.252795 1.569496 -0.569496	0.962007 -0.187943 0.198044	-0.162695 0.187881 0.968623	-0.063058 0.000006 7.310487
	20	6.919363 2.820075 0.912350	1.176377 -0.190568 0.158326	1.202184 1.445246 -0.445246	0.978534 -0.158518 0.131699	-0.111305 0.131290 0.985076	-0.063159 0.000006 14.144726
	21	10.492810 2.820112 1.209161	1.159507 -0.152447 0.091106	1.173028 1.375995 -0.375995	0.988473 -0.129960 0.077668	-0.067104 0.083793 0.994222	-0.061927 -0.000001 26.945343
	22	15.081688 2.820106 1.439410	1.149956 -0.126283 0.042833	1.157660 1.340178 -0.340178	0.993345 -0.109084 0.036999	-0.031933 0.047804 0.998346	-0.060024 0.000004 25.548492
	23	19.449387 2.820113 1.517232	1.144312 -0.113538 0.005570	1.149943 1.322371 -0.322371	0.995103 -0.098734 0.004844	-0.002927 0.019528 0.999805	-0.059555 0.000003 24.273834
	24	23.609985 2.820098 1.459319	1.129682 -0.101529 -0.036947	1.134836 1.287852 -0.287852	0.995458 -0.089466 -0.032557	0.031566 -0.012510 0.999424	-0.061971 0.000004 23.159317
	25	27.579529 2.820107 1.282760	1.105734 -0.088683 -0.067296	1.111323 1.235039 -0.235039	0.994970 -0.079799 -0.060554	0.057854 -0.035769 0.997684	-0.065086 0.000003 22.142944

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	26	31.370087 2.820125 1.030189	1.076205 -0.076364 -0.085318	1.082278 1.171327 -0.171327	0.994389 -0.070559 -0.078832	0.075367 -0.050523 0.995876	-0.068572 0.000002 21.193649
	27	34.993744 2.820097 0.737803	1.042395 -0.063883 -0.093330	1.048512 1.099377 -0.099377	0.994166 -0.060928 -0.089012	0.085462 -0.058613 0.994616	-0.072675 0.000002 20.299210
	28	38.462585 2.820112 0.437574	1.007907 -0.052398 -0.091029	1.013364 1.026906 -0.026906	0.994615 -0.051707 -0.089829	0.086721 -0.059572 0.994451	-0.077092 0.000004 19.449326
	29	40.980225 2.820111 0.217782	0.976286 -0.039779 -0.087806	0.981033 0.962426 0.037574	0.995161 -0.040548 -0.089504	0.087009 -0.059780 0.994412	-0.081010 0.000008 9.402838
	30	42.605057 2.820108 0.072996	0.935226 -0.015625 -0.095841	0.939287 0.882261 0.117739	0.995676 -0.016635 -0.091390	0.090205 -0.062035 0.993990	-0.086803 0.000005 9.222164

THE FORCE COMPONENTS OF THIS STRIP ARE -0.288747E+01 0.385122E+01 0.817770E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.225282E+03 -0.122911E+04 0.259880E+02

THE FORCE COMPONENTS OF THE SECTION ARE -0.342962E+02 0.409102E+02 0.395854E+03

THE MOMENT COMPONENTS OF THE SECTION ARE 0.562518E+04 -0.984334E+04 0.147422E+04

THE FORCE COMPONENTS OF THE ENTIRE BODY ARE -0.342962E+02 0.409102E+02 0.395854E+03

THE MOMENT COMPONENTS OF THE ENTIRE BODY ARE 0.562518E+04 -0.984334E+04 0.147422E+04

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

STRIP NO.	B (STRIP)
1	-0.688382E-02
2	-0.781087E-02
3	-0.765847E-02
4	-0.726851E-02

********** ********** **********

TOTAL RUN TIME FOR THIS CASE WAS 0.40778 MINUTES.

8.2.2 Boundary-Layer-Calculation Output

Strip No. 4 is shown. Also included is the simulation program output. This part of the output is the same for both blowing and displacment methods.

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

INTERMEDIATE PRINT IN SUBROUTINE SETUP

SECTION NO. = 1 TYPE = 1 TOTAL STRIPS = 4

STRIP NO. = 4 STAGNATION POINT = 14 XO = 0.279972E+00 YO = 0.235006E+00 ZO = -0.135495E-01

BL. STRIP	C. POINT	X	Y	Z	V	S
1	1	0.279972E+00	0.235006E+00	-0.135495E-01	0.0	0.0
1	2	0.302808E+00	0.235017E+00	-0.284209E-01	0.728941E+00	0.272515E-01
1	3	0.344856E+00	0.235004E+00	-0.407042E-01	0.764277E+00	0.710570E-01
1	4	0.422954E+00	0.235011E+00	-0.558196E-01	0.812320E+00	0.150604E+00
1	5	0.576618E+00	0.235008E+00	-0.760292E-01	0.857498E+00	0.305591E+00
1	6	0.874401E+00	0.235009E+00	-0.100763E+00	0.900705E+00	0.604400E+00
1	7	0.125691E+01	0.235009E+00	-0.119951E+00	0.943099E+00	0.987287E+00
1	8	0.162078E+01	0.235009E+00	-0.126436E+00	0.972688E+00	0.135132E+01
1	9	0.196750E+01	0.235008E+00	-0.121610E+00	0.993938E+00	0.169807E+01
1	10	0.229829E+01	0.235009E+00	-0.106897E+00	0.100097E+01	0.202919E+01
1	11	0.261417E+01	0.235010E+00	-0.858492E-01	0.998763E+00	0.234577E+01
1	12	0.291515E+01	0.235008E+00	-0.614836E-01	0.990338E+00	0.264872E+01
1	13	0.320522E+01	0.235009E+00	-0.364645E-01	0.975921E+00	0.293887E+01
1	14	0.341502E+01	0.235009E+00	-0.181485E-01	0.956792E+00	0.314947E+01
1	15	0.355042E+01	0.235009E+00	-0.608301E-02	0.939505E+00	0.328541E+01

K	PCHORD	XK (K)	ZK (K)	SK (K)	VK (K)
1	0.0	0.279972	-0.013549	0.0	0.0
2	0.002273	0.285995	-0.018241	0.007468	0.339816
3	0.004555	0.292220	-0.022483	0.014965	0.574609
4	0.006867	0.298709	-0.026303	0.022561	0.703799
5	0.009244	0.305589	-0.029710	0.030370	0.731760
6	0.011730	0.313136	-0.032600	0.038538	0.738882
7	0.014384	0.321509	-0.035090	0.047257	0.746110
8	0.017271	0.330819	-0.037382	0.056742	0.753591
9	0.020464	0.341137	-0.039783	0.067233	0.761483
10	0.024046	0.352562	-0.042598	0.079001	0.769946
11	0.028102	0.365562	-0.045487	0.092327	0.779023
12	0.032724	0.380465	-0.048431	0.107512	0.788707
13	0.038007	0.397569	-0.051494	0.124869	0.798908
14	0.044048	0.417151	-0.054827	0.144716	0.809433
15	0.050945	0.439494	-0.058555	0.167375	0.819823
16	0.058796	0.464997	-0.062385	0.193169	0.829418
17	0.067697	0.493986	-0.066285	0.222413	0.838107
18	0.077742	0.526759	-0.070292	0.255414	0.846154
19	0.089022	0.563587	-0.074539	0.292474	0.854441
20	0.101623	0.604723	-0.079129	0.333873	0.863818
21	0.115622	0.650483	-0.083687	0.379866	0.872415
22	0.131092	0.701117	-0.088143	0.430691	0.880043
23	0.148098	0.756833	-0.092509	0.486563	0.886975
24	0.166692	0.817783	-0.096873	0.547652	0.893892
25	0.186918	0.884081	-0.101422	0.614103	0.901958
26	0.208807	0.956846	-0.106006	0.686017	0.910907
27	0.232376	1.036164	-0.110369	0.763451	0.919331
28	0.257630	1.116046	-0.114424	0.846421	0.928975

30	0.313123	1.298234	-0.121269	1.028738	0.946977
31	0.343287	1.397307	-0.123829	1.127839	0.955623
32	0.374981	1.[illegible]433	-0.125600	1.231967	0.963916
33	0.408119	1.[illegible]0304	-0.126415	1.340839	0.971942
34	0.442592	1.723558	-0.126127	1.454097	0.979922
35	0.478271	1.840782	-0.124625	1.571318	0.987503
36	0.515000	1.961420	-0.121788	1.691987	0.993687
37	0.552599	2.084867	-0.117424	1.815516	0.997776
38	0.590864	2.210459	-0.111595	1.941232	1.000124
39	0.629560	2.337401	-0.104647	2.068364	1.001160
40	0.668427	2.464837	-0.096501	2.196058	1.000766
41	0.707171	2.591812	-0.087494	2.323348	0.999146
42	0.745470	2.717273	-0.077908	2.449176	0.996604
43	0.782969	2.840064	-0.067849	2.572376	0.993085
44	0.819281	2.958946	-0.057871	2.691676	0.988667
45	0.853081	3.072526	-0.048060	2.805679	0.983821
46	0.883611	3.179322	-0.038721	2.912883	0.977748
47	0.916674	3.277720	-0.030162	3.011652	0.970214
48	0.943639	3.365977	-0.022464	3.100244	0.962053
49	0.966931	3.442205	-0.015741	3.176767	0.953633
50	0.985936	3.504398	-0.010206	3.239206	0.945818
51	1.000000	3.550422	-0.006083	3.285413	0.939505

BOUNDARY LAYER PROGRAM OUTPUT FOLLOWS

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 0.143106E+00)

TRFLAG =1 TRINT =0 TVC =0 SHCRTP =1

TRANSITION SPECIFIED AT STATION 10000

BODY GEOMETRY DATA

K	X/C	Y/C	X	S	S/C
1	0.2799721E+00	-0.1354950E-01	0.2799721E+00	0.0	0.0
2	0.2859949E+00	-0.1824099E-01	0.2859949E+00	0.7467743E-02	0.7467743E-02
3	0.2922201E+00	-0.2248305E-01	0.2922201E+00	0.1496506E-01	0.1496506E-01
4	0.2987093E+00	-0.2630263E-01	0.2987093E+00	0.2256092E-01	0.2256092E-01
5	0.3055988E+00	-0.2971019E-01	0.3055988E+00	0.3037035E-01	0.3037035E-01
6	0.3131364E+00	-0.3259987E-01	0.3131364E+00	0.3853799E-01	0.3853789E-01
7	0.3215093E+00	-0.3508960E-01	0.3215093E+00	0.4725738E-01	0.4725738E-01
8	0.3308187E+00	-0.3738155E-01	0.3308187E+00	0.5674237E-01	0.5674237E-01
9	0.3411370E+00	-0.3978303E-01	0.3411370E+00	0.6723267E-01	0.6723267E-01
10	0.3525615E+00	-0.4259810E-01	0.3525615E+00	0.7900101E-01	0.7900101E-01
11	0.3655623E+00	-0.4548692E-01	0.3655623E+00	0.9232664E-01	0.9232664E-01
12	0.3804651E+00	-0.4843112E-01	0.3804651E+00	0.1075118E+00	0.1075118E+00
13	0.3975689E+00	-0.5149403E-01	0.3975689E+00	0.1248686E+00	0.1248686E+00
14	0.4171509E+00	-0.5482722E-01	0.4171509E+00	0.1447158E+00	0.1447158E+00
15	0.4394937E+00	-0.5855507E-01	0.4394937E+00	0.1673753E+00	0.1673753E+00
16	0.4649971E+00	-0.6238540E-01	0.4649971E+00	0.1931691E+00	0.1931691E+00
17	0.4939355E+00	-0.6628507E-01	0.4939355E+00	0.2224125E+00	0.2224125E+00
18	0.5267591E+00	-0.7029212E-01	0.5267591E+00	0.2554145E+00	0.2554145E+00
19	0.5635870E+00	-0.7453853E-01	0.5635870E+00	0.2924739E+00	0.2924739E+00
20	0.6047227E+00	-0.7912940E-01	0.6047227E+00	0.3338735E+00	0.3338735E+00
21	0.6504833E+00	-0.8368695E-01	0.6504833E+00	0.3798659E+00	0.3798659E+00
22	0.7011174E+00	-0.8914251E-01	0.7011174E+00	0.4306914E+00	0.4306914E+00
23	0.7563328E+00	-0.9250909E-01	0.7563328E+00	0.4865630E+00	0.4865630E+00
24	0.8177334E+00	-0.9687334E-01	0.8177834E+00	0.5476521E+00	0.5476521E+00
25	0.8840806E+00	-0.1014224E+00	0.8840806E+00	0.6141028E+00	0.6141028E+00
26	0.9559464E+00	-0.1060056E+00	0.9559464E+00	0.6860172E+00	0.6860172E+00
27	0.1033164E+01	-0.1103693E+00	0.1033164E+01	0.7634510E+00	0.7634510E+00
28	0.1116046E+01	-0.1144243E+00	0.1116046E+01	0.8464208E+00	0.8464208E+00
29	0.1204437E+01	-0.1180851E+00	0.1204437E+01	0.9348807E+00	0.9348807E+00
30	0.1298234E+01	-0.1212690E+00	0.1298234E+01	0.1028738E+01	0.1028738E+01
31	0.1397307E+01	-0.1238291E+00	0.1397307E+01	0.1127839E+01	0.1127839E+01
32	0.1501433E+01	-0.1255997E+00	0.1501433E+01	0.1231967E+01	0.1231967E+01
33	0.1610304E+01	-0.1264147E+00	0.1610304E+01	0.1340839E+01	0.1340839E+01
34	0.1723558E+01	-0.1261275E+00	0.1723558E+01	0.1454097E+01	0.1454097E+01
35	0.1840782E+01	-0.1246249E+00	0.1840782E+01	0.1571318E+01	0.1571318E+01

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

BODY GEOMETRY DATA

K	X/C	Y/C	X	S	S/C
36	0.1951420E+01	-0.1217877E+00	0.1961420E+01	0.1691987E+01	0.1691987E+01
37	0.2084367E+01	-0.1174236E+00	0.2084867E+01	0.1815516E+01	0.1815516E+01
38	0.2210459E+01	-0.1115952E+00	0.2210459E+01	0.1941232E+01	0.1941232E+01
39	0.2337401E+01	-0.1046471E+00	0.2337401E+01	0.2068364E+01	0.2068364E+01
40	0.2464337E+01	-0.9650141E-01	0.2464837E+01	0.2196058E+01	0.2196058E+01
41	0.2591312E+01	-0.8749366E-01	0.2591812E+01	0.2323348E+01	0.2323348E+01
42	0.2717273E+01	-0.7790768E-01	0.2717273E+01	0.2449176E+01	0.2449176E+01
43	0.2840064E+01	-0.6784862E-01	0.2840064E+01	0.2572376E+01	0.2572376E+01
44	0.2958946E+01	-0.5787063E-01	0.2958946E+01	0.2691676E+01	0.2691676E+01
45	0.3072526E+01	-0.4806018E-01	0.3072526E+01	0.2805679E+01	0.2805679E+01
46	0.3179322E+01	-0.3872086E-01	0.3179322E+01	0.2912883E+01	0.2912883E+01
47	0.3277720E+01	-0.3016249E-01	0.3277720E+01	0.3011652E+01	0.3011652E+01
48	0.3365977E+01	-0.2246421E-01	0.3365977E+01	0.3100244E+01	0.3100244E+01
49	0.3442205E+01	-0.1574132E-01	0.3442205E+01	0.3176767E+01	0.3176767E+01
50	0.3504398E+01	-0.1020554E-01	0.3504398E+01	0.3239206E+01	0.3239206E+01
51	0.3550422E+01	-0.6083012E-02	0.3550422E+01	0.3285413E+01	0.3285413E+01

REFERENCE QUANTITIES AND CONTROL PARAMETERS

H1 =	0.00500	C =	0.1000000E+01	PRO =	0.72000
K =	1.1+000	RHOREF =	0.1110765E-01	SWEEP =	0.0
KK =	0.0	MUREF =	0.3700334E-06	HE =	0.3157074E+07
EPS1 =	0.4999999E-02	VREF =	0.2231996E+03	TREF =	519.000
		REY =	0.6700000E+07	MREF =	0.1995392E+00

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

STATION DATA

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	FW FPW SQUIG
0.279972E+00	-0.135495E-01	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.100000E+01	0.370033E-06	0.0
0.100000E+01	0.0	0.0	0.0	0.0	0.0
0.285995E+00	-0.182410E-01	0.0	0.758468E+02	0.0	0.0
0.746774E-02	0.0	0.0	0.884525E+00	0.370033E-06	0.0
0.100000E+01	0.0	0.0	0.0	0.0	0.116402E-08
0.292220E+00	-0.224830E-01	0.0	0.128253E+03	0.0	0.0
0.149651E-01	0.0	0.0	0.669824E+00	0.370033E-06	0.0
0.688743E+00	0.0	0.0	0.0	0.0	0.430872E-08
0.298709E+00	-0.263026E-01	0.0	0.157088E+03	0.0	0.0
0.225509E-01	0.0	0.0	0.504667E+00	0.370033E-06	0.0
0.400415E+00	0.0	0.0	0.0	0.0	0.876295E-08
0.305589E+00	-0.297102E-01	0.0	0.163329E+03	0.0	0.0
0.303704E-01	0.0	0.0	0.464527E+00	0.370033E-06	0.0
0.127751E+00	0.0	0.0	0.0	0.0	0.139054E-07
0.313136E+00	-0.325999E-01	0.0	0.164918E+03	0.0	0.0
0.385379E-01	0.0	0.0	0.454053E+00	0.370033E-06	0.0
0.659710E-01	0.0	0.0	0.0	0.0	0.194150E-07
0.321509E+00	-0.350896E-01	0.0	0.166531E+03	0.0	0.0
0.472574E-01	0.0	0.0	0.443320E+00	0.370033E-06	0.0
0.804301E-01	0.0	0.0	0.0	0.0	0.253544E-07
0.330319E+00	-0.373815E-01	0.0	0.168201E+03	0.0	0.0
0.567424E-01	0.0	0.0	0.432100E+00	0.370033E-06	0.0
0.944570E-01	0.0	0.0	0.0	0.0	0.318792E-07
0.341137E+00	-0.397830E-01	0.0	0.169963E+03	0.0	0.0
0.672327E-01	0.0	0.0	0.420144E+00	0.370033E-06	0.0
0.108435E+00	0.0	0.0	0.0	0.0	0.391695E-07
0.352562E+00	-0.425981E-01	0.0	0.171852E+03	0.0	0.0
0.790010E-01	0.0	0.0	0.407184E+00	0.370033E-06	0.0
0.122341E+00	0.0	0.0	0.0	0.0	0.474363E-07
0.365562E+00	-0.454869E-01	0.0	0.173878E+03	0.0	0.0
0.923266E-01	0.0	0.0	0.393123E+00	0.370033E-06	0.0
0.135099E+00	0.0	0.0	0.0	0.0	0.569043E-07

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	FW FPW SQUIG
0.390465E+00	-0.484311E-01	0.0	0.176039E+03	0.0	0.0
0.107512E+00	0.0	0.0	0.377941E+00	0.370033E-06	0.0
0.146045E+00	0.0	0.0	0.0	0.0	0.678241E-07
0.397569E+00	-0.514940E-01	0.0	0.178316E+03	0.0	0.0
0.124369E+00	0.0	0.0	0.361745E+00	0.370033E-06	0.0
0.154171E+00	0.0	0.0	0.0	0.0	0.804640E-07
0.417151E+00	-0.548272E-01	0.0	0.180665E+03	0.0	0.0
0.144716E+00	0.0	0.0	0.344818E+00	0.370033E-06	0.0
0.157212E+00	0.0	0.0	0.0	0.0	0.951060E-07
0.439494E+00	-0.585551E-01	0.0	0.182984E+03	0.0	0.0
0.167375E+00	0.0	0.0	0.327891E+00	0.370033E-06	0.0
0.151028E+00	0.0	0.0	0.0	0.0	0.112040E-06
0.464997E+00	-0.623854E-01	0.0	0.185126E+03	0.0	0.0
0.193169E+00	0.0	0.0	0.312066E+00	0.370033E-06	0.0
0.140452E+00	0.0	0.0	0.0	0.0	0.131553E-06
0.493996E+00	-0.662851E-01	0.0	0.187065E+03	0.0	0.0
0.222413E+00	0.0	0.0	0.297577E+00	0.370033E-06	0.0
0.129983E+00	0.0	0.0	0.0	0.0	0.153921E-06
0.526759E+00	-0.702921E-01	0.0	0.188861E+03	0.0	0.0
0.255414E+00	0.0	0.0	0.284024E+00	0.370033E-06	0.0
0.128007E+00	0.0	0.0	0.0	0.0	0.179417E-06
0.563587E+00	-0.745385E-01	0.0	0.190711E+03	0.0	0.0
0.292474E+00	0.0	0.0	0.269931E+00	0.370033E-06	0.0
0.139958E+00	0.0	0.0	0.0	0.0	0.208326E-06
0.604723E+00	-0.791294E-01	0.0	0.192804E+03	0.0	0.0
0.333373E+00	0.0	0.0	0.253819E+00	0.370033E-06	0.0
0.146254E+00	0.0	0.0	0.0	0.0	0.240955E-06
0.650483E+00	-0.836869E-01	0.0	0.194723E+03	0.0	0.0
0.379866E+00	0.0	0.0	0.238892E+00	0.370033E-06	0.0
0.134707E+00	0.0	0.0	0.0	0.0	0.277584E-06
0.701117E+00	-0.881425E-01	0.0	0.196425E+03	0.0	0.0
0.430691E+00	0.0	0.0	0.225524E+00	0.370033E-06	0.0
0.123426E+00	0.0	0.0	0.0	0.0	0.318440E-06
0.756333E+00	-0.925091E-01	0.0	0.197972E+03	0.0	0.0
0.486563E+00	0.0	0.0	0.213275E+00	0.370033E-06	0.0
0.119743E+00	0.0	0.0	0.0	0.0	0.363725E-06

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	FW FPW SQUIG
0.917783E+00	-0.968733E-01	0.0	0.199514E+03	0.0	0.0
0.547652E+00	0.0	0.0	0.200976E+00	0.370033E-06	0.0
0.132323E+00	0.0	0.0	0.0	0.0	0.413627E-06
0.894081E+00	-0.101422E+00	0.0	0.201317E+03	0.0	0.0
0.614103E+00	0.0	0.0	0.186472E+00	0.370033E-06	0.0
0.154297E+00	0.0	0.0	0.0	0.0	0.468366E-06
0.955346E+00	-0.106006E+00	0.0	0.203314E+03	0.0	0.0
0.686017E+00	0.0	0.0	0.170249E+00	0.370033E-06	0.0
0.167459E+00	0.0	0.0	0.0	0.0	0.528166E-06
0.103316E+01	-0.110369E+00	0.0	0.205328E+03	0.0	0.0
0.763451E+00	0.0	0.0	0.153728E+00	0.370033E-06	0.0
0.172685E+00	0.0	0.0	0.0	0.0	0.593195E-06
0.111505E+01	-0.114424E+00	0.0	0.207347E+03	0.0	0.0
0.846421E+00	0.0	0.0	0.137006E+00	0.370033E-06	0.0
0.177134E+00	0.0	0.0	0.0	0.0	0.663561E-06
0.120444E+01	-0.118085E+00	0.0	0.209362E+03	0.0	0.0
0.934381E+00	0.0	0.0	0.120147E+00	0.370033E-06	0.0
0.181404E+00	0.0	0.0	0.0	0.0	0.739316E-06
0.129823E+01	-0.121269E+00	0.0	0.211365E+03	0.0	0.0
0.102374E+01	0.0	0.0	0.103235E+00	0.370033E-06	0.0
0.185573E+00	0.0	0.0	0.0	0.0	0.820468E-06
0.139731E+01	-0.123829E+00	0.0	0.213295E+03	0.0	0.0
0.112784E+01	0.0	0.0	0.867847E-01	0.370033E-06	0.0
0.180177E+00	0.0	0.0	0.0	0.0	0.906956E-06
0.150143E+01	-0.125600E+00	0.0	0.215146E+03	0.0	0.0
0.123197E+01	0.0	0.0	0.708653E-01	0.370033E-06	0.0
0.179831E+00	0.0	0.0	0.0	0.0	0.998639E-06
0.161033E+01	-0.126415E+00	0.0	0.216937E+03	0.0	0.0
0.134184E+01	0.0	0.0	0.553289E-01	0.370033E-06	0.0
0.182301E+00	0.0	0.0	0.0	0.0	0.109531E-05
0.172356E+01	-0.126127E+00	0.0	0.218718E+03	0.0	0.0
0.145410E+01	0.0	0.0	0.397531E-01	0.370033E-06	0.0
0.183709E+00	0.0	0.0	0.0	0.0	0.119671E-05
0.184179E+01	-0.124625E+00	0.0	0.220410E+03	0.0	0.0
0.157132E+01	0.0	0.0	0.248374E-01	0.370033E-06	0.0
0.169159E+00	0.0	0.0	0.0	0.0	0.130250E-05

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	FW FPW SQUIG
0.196142E+01	-0.121788E+00	0.0	0.221790E+03	0.0	0.0
0.169199E+01	0.0	0.0	0.125868E-01	0.370033E-06	0.0
0.131326E+00	0.0	0.0	0.0	0.0	0.141216E-05
0.209487E+01	-0.117424E+00	0.0	0.222703E+03	0.0	0.0
0.181552E+01	0.0	0.0	0.444245E-02	0.370033E-06	0.0
0.966733E-01	0.0	0.0	0.0	0.0	0.152500E-05
0.221046E+01	-0.111595E+00	0.0	0.223227E+03	0.0	0.0
0.194123E+01	0.0	0.0	-0.247002E-03	0.370033E-06	0.0
0.430500E-01	0.0	0.0	0.0	0.0	0.164021E-05
0.233740E+01	-0.104647E+00	0.0	0.223458E+03	0.0	0.0
0.206336E+01	0.0	0.0	-0.232029E-02	0.370033E-06	0.0
0.972242E-02	0.0	0.0	0.0	0.0	0.175691E-05
0.246434E+01	-0.965014E-01	0.0	0.223370E+03	0.0	0.0
0.219606E+01	0.0	0.0	-0.153160E-02	0.370033E-06	0.0
-0.322713E-01	0.0	0.0	0.0	0.0	0.187417E-05
0.259181E+01	-0.874937E-01	0.0	0.223009E+03	0.0	0.0
0.232335E+01	0.0	0.0	0.170702E-02	0.370033E-06	0.0
-0.716595E-01	0.0	0.0	0.0	0.0	0.199094E-05
0.271727E+01	-0.779077E-01	0.0	0.222442E+03	0.0	0.0
0.244918E+01	0.0	0.0	0.678033E-02	0.370033E-06	0.0
-0.112924E+00	0.0	0.0	0.0	0.0	0.210613E-05
0.284036E+01	-0.678486E-01	0.0	0.221656E+03	0.0	0.0
0.257239E+01	0.0	0.0	0.137827E-01	0.370033E-06	0.0
-0.161200E+00	0.0	0.0	0.0	0.0	0.221857E-05
0.295395E+01	-0.578706E-01	0.0	0.220670E+03	0.0	0.0
0.269168E+01	0.0	0.0	0.225386E-01	0.370033E-06	0.0
-0.206740E+00	0.0	0.0	0.0	0.0	0.232702E-05
0.307253E+01	-0.480602E-01	0.0	0.219588E+03	0.0	0.0
0.280569E+01	0.0	0.0	0.320972E-01	0.370033E-06	0.0
-0.272550E+00	0.0	0.0	0.0	0.0	0.243016E-05
0.317332E+01	-0.387209E-01	0.0	0.218233E+03	0.0	0.0
0.291289E+01	0.0	0.0	0.440093E-01	0.370033E-06	0.0
-0.335254E+00	0.0	0.0	0.0	0.0	0.252662E-05
0.327772E+01	-0.301625E-01	0.0	0.216551E+03	0.0	0.0
0.301165E+01	0.0	0.0	0.586847E-01	0.370033E-06	0.0
-0.512517E+00	0.0	0.0	0.0	0.0	0.261487E-05

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	FW FPW SQUIG
0.336598E+01	-0.224642E-01	0.0	0.214730E+03	0.0	0.0
0.310324E+01	0.0	0.0	0.744546E-01	0.370033E-06	0.0
-0.645365E+00	0.0	0.0	0.0	0.0	0.269339E-05
0.344221E+01	-0.157413E-01	0.0	0.212851E+03	0.0	0.0
0.317677E+01	0.0	0.0	0.905836E-01	0.370033E-06	0.0
-0.793326E+00	0.0	0.0	0.0	0.0	0.276064E-05
0.350440E+01	-0.102055E-01	0.0	0.211106E+03	0.0	0.0
0.323321E+01	0.0	0.0	0.105429E+00	0.370033E-06	0.0
-0.903798E+00	0.0	0.0	0.0	0.0	0.281504E-05
0.355042E+01	-0.608301E-02	0.0	0.209697E+03	0.0	0.0
0.328541E+01	0.0	0.0	0.117330E+00	0.370033E-06	0.0
-0.963342E+00	0.0	0.0	0.0	0.0	0.285499E-05

TRANSITION HAS CCCURRED AT STATICN 41

TURBULENT FLOW STARTED WITH NTR = 41

109

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

CUTPUT SUMMARY

N Y/C	S RX	THETA RTHETA	DELS H	CF CFA	FPPW GPW	GW ST	IMAX ETAINF
1	0.0	0.0	0.0	0.0	0.123317E+01	0.0	41
279972	0.0	0.0	0.133103E+01	0.0	0.0	0.0	6.710110
2	0.746774E-02	0.167044E-04	0.371086E-04	0.189147E-01	0.123317E+01	0.0	45
285995	0.170023E+05	0.380321E+02	0.222148E+01	0.554700E-02	0.0	0.0	11.357721
3	0.149651E-01	0.202430E-04	0.459944E-04	0.860217E-02	0.107901E+01	0.0	41
292220	0.576137E+05	0.779331E+02	0.227211E+01	0.400453E-02	0.0	0.0	6.710110
4	0.225609E-01	0.257395E-04	0.603307E-04	0.502039E-02	0.898063E+00	0.0	41
298709	0.106335E+06	0.121373E+03	0.234390E+01	0.354010E-02	0.0	0.0	6.710110
5	0.303704E-01	0.340612E-04	0.832853E-04	0.315490E-02	0.710921E+00	0.0	41
305589	0.149399E+06	0.166995E+03	0.244516E+01	0.315015E-02	0.0	0.0	6.710110
6	0.385379E-01	0.425203E-04	0.106859E-03	0.231038E-02	0.615172E+00	0.0	42
313136	0.190782E+06	0.210497E+03	0.251313E+01	0.276900E-02	0.0	0.0	7.654526
7	0.472574E-01	0.497461E-04	0.125043E-03	0.197838E-02	0.601978E+00	0.0	42
321509	0.236237E+06	0.248678E+03	0.251362E+01	0.244896E-02	0.0	0.0	7.654526
8	0.567424E-01	0.561461E-04	0.140693E-03	0.175859E-02	0.600014E+00	0.0	42
330819	0.296495E+06	0.283485E+03	0.250584E+01	0.219293E-02	0.0	0.0	7.654526
9	0.672327E-01	0.621354E-04	0.154919E-03	0.160329E-02	0.606359E+00	0.0	42
341137	0.343017E+06	0.317010E+03	0.249324E+01	0.198556E-02	0.0	0.0	7.654526
10	0.790010E-01	0.679161E-04	0.168569E-03	0.147286E-02	0.613000E+00	0.0	42
352562	0.407537E+06	0.350354E+03	0.248202E+01	0.181493E-02	0.0	0.0	7.654526
11	0.923266E-01	0.736190E-04	0.181843E-03	0.136545E-02	0.622433E+00	0.0	42
365562	0.481395E+06	0.384250E+03	0.247006E+01	0.166850E-02	0.0	0.0	7.654526
12	0.107512E+00	0.793524E-04	0.195234E-03	0.126651E-02	0.630298E+00	0.0	42
390465	0.568129E+06	0.419324E+03	0.246034E+01	0.154093E-02	0.0	0.0	7.654526
13	0.124369E+00	0.852067E-04	0.208912E-03	0.117715E-02	0.638085E+00	0.0	42
397569	0.668382E+06	0.456084E+03	0.245183E+01	0.142874E-02	0.0	0.0	7.654526
14	0.144716E+00	0.912869E-04	0.223374E-03	0.108955E-02	0.642089E+00	0.0	42
417151	0.794823E+06	0.495067E+03	0.244695E+01	0.132937E-02	0.0	0.0	7.654526
15	0.167375E+00	0.977559E-04	0.239152E-03	0.100312E-02	0.641632E+00	0.0	42
439494	0.919361E+06	0.536954E+03	0.244642E+01	0.124038E-02	0.0	0.0	7.654526

110

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N I/C	S RX	THETA RTHETA	DELS H	CF CFA	FPPW GPW	GW ST	IMAX ETAINF
6 64997	0.193169E+00 0.107346E+07	0.104796E-03 0.582359E+03	0.256881E-03 0.245125E+01	0.916453E-03 0.115932E-02	0.635192E+00 0.0	0.0 0.0	42 7.654526
7 93986	0.222413E+00 0.124892E+07	0.112436E-03 0.631363E+03	0.276342E-03 0.245777E+01	0.837219E-03 0.108482E-02	0.627672E+00 0.0	0.0 0.0	42 7.654526
8 26759	0.255414E+00 0.144800E+07	0.120532E-03 0.683323E+03	0.296734E-03 0.246186E+01	0.769957E-03 0.101641E-02	0.623222E+00 0.0	0.0 0.0	42 7.654526
9 63587	0.292474E+00 0.167434E+07	0.129742E-03 0.737018E+03	0.316523E-03 0.245857E+01	0.719569E-03 0.954324E-03	0.627608E+00 0.0	0.0 0.0	42 7.654526
0 04723	0.333373E+00 0.193232E+07	0.136981E-03 0.792212E+03	0.335838E-03 0.245350E+01	0.674314E-03 0.898580E-03	0.632521E+00 0.0	0.0 0.0	42 7.654526
1 50483	0.379366E+00 0.222038E+07	0.145502E-03 0.850483E+03	0.357277E-03 0.245548E+01	0.624465E-03 0.848021E-03	0.628708E+00 0.0	0.0 0.0	42 7.654526
2 01117	0.430591E+00 0.253948E+07	0.154771E-03 0.912570E+03	0.381056E-03 0.246207E+01	0.575712E-03 0.801439E-03	0.620816E+00 0.0	0.0 0.0	42 7.654526
3 56933	0.486563E+00 0.289151E+07	0.164482E-03 0.977471E+03	0.405714E-03 0.246661E+01	0.534617E-03 0.758418E-03	0.616132E+00 0.0	0.0 0.0	42 7.654526
4 17783	0.547652E+00 0.327089E+07	0.174217E-03 0.104339E+04	0.429292E-03 0.246412E+01	0.504338E-03 0.719134E-03	0.619827E+00 0.0	0.0 0.0	41 6.710110
5 84081	0.614103E+00 0.371109E+07	0.183455E-03 0.110864E+04	0.450146E-03 0.245372E+01	0.483397E-03 0.683904E-03	0.632181E+00 0.0	0.0 0.0	43 8.731161
6 55846	0.686017E+00 0.413681E+07	0.192303E-03 0.117364E+04	0.469850E-03 0.244328E+01	0.463219E-03 0.652570E-03	0.643304E+00 0.0	0.0 0.0	43 8.731161
7 33164	0.763451E+00 0.470555E+07	0.201147E-03 0.123977E+04	0.490120E-03 0.243663E+01	0.441845E-03 0.624501E-03	0.650300E+00 0.0	0.0 0.0	43 8.731161
8 16046	0.846421E+00 0.526323E+07	0.210051E-03 0.130738E+04	0.510892E-03 0.243223E+01	0.421020E-03 0.599136E-03	0.655372E+00 0.0	0.0 0.0	43 8.731161
9 04437	0.934881E+00 0.587537E+07	0.218977E-03 0.137619E+04	0.531790E-03 0.242852E+01	0.401742E-03 0.576119E-03	0.660095E+00 0.0	0.0 0.0	43 8.731161
0 98234	0.103374E+01 0.652707E+07	0.227941E-03 0.144623E+04	0.553040E-03 0.242624E+01	0.383032E-03 0.555150E-03	0.662995E+00 0.0	0.0 0.0	43 8.731161

111

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 0.143106E+00)

N X/C	S RX	THETA RTHETA	DELS H	CF CFA	FPPW GPW	GW ST	IMAX ETAINF
31	0.112784E+01	0.237040E-03	0.574974E-03	0.364858E-03	0.663990E+00	0.0	43
397307	0.722118E+07	0.151769E+04	0.242565E+01	0.535926E-03	0.0	0.0	8.731161
32	0.123197E+01	0.246251E-03	0.597370E-03	0.347827E-03	0.664219E+00	0.0	43
501433	0.795533E+07	0.159034E+04	0.242586E+01	0.518216E-03	0.0	0.0	8.731161
33	0.134084E+01	0.255449E-03	0.619523E-03	0.332921E-03	0.665817E+00	0.0	43
610304	0.873155E+07	0.166348E+04	0.242524E+01	0.501900E-03	0.0	0.0	8.731161
34	0.145410E+01	0.264514E-03	0.641266E-03	0.319254E-03	0.667384E+00	0.0	43
723558	0.954683E+07	0.173666E+04	0.242432E+01	0.486886E-03	0.0	0.0	8.731161
35	0.157132E+01	0.273742E-03	0.664582E-03	0.303737E-03	0.662417E+00	0.0	43
840782	0.103963E+08	0.181115E+04	0.242777E+01	0.472954E-03	0.0	0.0	8.731161
36	0.169199E+01	0.283830E-03	0.692807E-03	0.283945E-03	0.644794E+00	0.0	43
961420	0.112647E+08	0.188966E+04	0.244092E+01	0.459704E-03	0.0	0.0	8.731161
37	0.181552E+01	0.295210E-03	0.727084E-03	0.261924E-03	0.618095E+00	0.0	43
084367	0.121369E+08	0.197351E+04	0.246294E+01	0.446768E-03	0.0	0.0	8.731161
38	0.194123E+01	0.307640E-03	0.765593E-03	0.240940E-03	0.589661E+00	0.0	43
210459	0.130079E+08	0.206144E+04	0.249860E+01	0.434024E-03	0.0	0.0	8.731161
39	0.206336E+01	0.320806E-03	0.807315E-03	0.221154E-03	0.560163E+00	0.0	43
337401	0.138741E+08	0.215189E+04	0.251652E+01	0.421518E-03	0.0	0.0	8.731161
40	0.219606E+01	0.334741E-03	0.853204E-03	0.201532E-03	0.527222E+00	0.0	43
464837	0.147248E+08	0.224448E+04	0.254885E+01	0.409283E-03	0.0	0.0	8.731161
41	0.232335E+01	0.426717E-03	0.623483E-03	0.265391E-02	0.715582E+01	0.0	48
591812	0.155531E+08	0.285656E+04	0.146112E+01	0.465103E-03	0.0	0.0	16.844162
42	0.244018E+01	0.617325E-03	0.832478E-03	0.325346E-02	0.902261E+01	0.0	51
717273	0.163537E+08	0.412203E+04	0.134852E+01	0.592519E-03	0.0	0.0	24.972534
43	0.257238E+01	0.803633E-03	0.109100E-02	0.272593E-02	0.775882E+01	0.0	51
840064	0.171157E+08	0.539036E+04	0.134919E+01	0.706066E-03	0.0	0.0	24.972534
44	0.269168E+01	0.988135E-03	0.131971E-02	0.285398E-02	0.831944E+01	0.0	49
958946	0.178298E+08	0.654546E+04	0.133555E+01	0.796280E-03	0.0	0.0	19.207336
45	0.280568E+01	0.116091E-02	0.154886E-02	0.257889E-02	0.768237E+01	0.0	52
072526	0.184939E+08	0.765221E+04	0.133418E+01	0.871385E-03	0.0	0.0	28.473679

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N /C	S RX	THETA RTHETA	DELS H	CF CFA	FPPW GPW	GW ST	IMAX ETAINF
6	0.291288E+01	0.132786E-02	0.176304E-02	0.267197E-02	0.811608E+01	0.0	52
79322	0.190820E+08	0.869870E+04	0.132773E+01	0.932304E-03	0.0	0.0	28.473679
7	0.301165E+01	0.149085E-02	0.198113E-02	0.246782E-02	0.762577E+01	0.0	52
77720	0.195770E+08	0.969113E+04	0.132886E+01	0.981750E-03	0.0	0.0	28.473679
8	0.310024E+01	0.164589E-02	0.218289E-02	0.252445E-02	0.791700E+01	0.0	54
65977	0.199834E+08	0.106090E+05	0.132627E+01	0.102030E-02	0.0	0.0	37.015076
9	0.317677E+01	0.179005E-02	0.237812E-02	0.238444E-02	0.757067E+01	0.0	53
42205	0.203974E+08	0.114372E+05	0.132852E+01	0.105000E-02	0.0	0.0	32.464981
0	0.323921E+01	0.191554E-02	0.254434E-02	0.240651E-02	0.771567E+01	0.0	55
04398	0.205268E+08	0.121387E+05	0.132826E+01	0.107143E-02	0.0	0.0	42.202179
1	0.328541E+01	0.201317E-02	0.267961E-02	0.235150E-02	0.759263E+01	0.0	55
50422	0.206306E+08	0.126723E+05	0.133103E+01	0.108610E-02	0.0	0.0	42.202179

I	SM (I)	VB (I)	DEL (I)
1	0.0	0.0	0.0
2	0.272515E-01	0.728941E+00	0.737480E-04
3	0.710570E-01	0.764277E+00	0.159600E-03
4	0.150604E+00	0.812320E+00	0.227535E-03
5	0.305591E+00	0.857498E+00	0.322861E-03
6	0.604400E+00	0.900705E+00	0.447282E-03
7	0.987287E+00	0.943099E+00	0.543739E-03
8	0.135132E+01	0.972688E+00	0.621583E-03
9	0.169807E+01	0.993938E+00	0.694369E-03
10	0.202919E+01	0.100097E+01	0.794075E-03
11	0.234577E+01	0.998763E+00	0.633911E-03
12	0.264972E+01	0.990338E+00	0.123741E-02
13	0.293887E+01	0.975921E+00	0.181883E-02
14	0.314947E+01	0.956792E+00	0.230700E-02
15	0.328541E+01	0.939505E+00	0.267961E-02

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

INTERMEDIATE PRINT IN SUBROUTINE SETUP

SECTION NO. = 1 TYPE = 1 TOTAL STRIPS = 4

STRIP NO. = 4 STAGNATION POINT = 14 XO = 0.279972E+00 YO = 0.235006E+00 ZO = -0.135495E-01

BL. STRIP	C. POINT	X	Y	Z	V	S
2	1	0.279972E+00	0.235006E+00	-0.135495E-01	0.0	0.0
2	2	0.276484E+00	0.235005E+00	-0.112779E-01	0.901386E+00	0.416265E-02
2	3	0.276484E+00	0.235005E+00	0.112779E-01	0.147966E+01	0.267194E-01
2	4	0.302908E+00	0.235017E+00	0.384209E-01	0.145054E+01	0.581325E-01
2	5	0.344856E+00	0.235004E+00	0.607042E-01	0.133184E+01	0.101938E+00
2	6	0.422956E+00	0.235014E+00	0.558196E-01	0.125280E+01	0.181487E+00
2	7	0.576614E+00	0.235006E+00	0.760292E-01	0.120218E+01	0.336458E+00
2	8	0.874401E+00	0.235009E+00	0.100763E+00	0.117303E+01	0.635281E+00
2	9	0.125681E+01	0.235009E+00	0.119951E+00	0.115766E+01	0.101917E+01
2	10	0.162078E+01	0.235009E+00	0.126436E+00	0.114994E+01	0.138220E+01
2	11	0.196750E+01	0.235008E+00	0.121610E+00	0.113484E+01	0.172835E+01
2	12	0.229829E+01	0.235009E+00	0.106897E+00	0.111132E+01	0.206007E+01
2	13	0.261417E+01	0.235010E+00	0.858491E-01	0.108228E+01	0.237665E+01
2	14	0.291615E+01	0.235008E+00	0.614836E-01	0.104851E+01	0.267960E+01
2	15	0.320522E+01	0.235009E+00	0.364645E-01	0.101336E+01	0.296975E+01
2	16	0.341502E+01	0.235009E+00	0.181485E-01	0.981033E+00	0.318036E+01
2	17	0.355042E+01	0.235009E+00	0.608301E-02	0.939287E+00	0.331629E+01

K	PCHORD	XK (K)	ZK (K)	SK (K)	VK (K)
1	0.0	0.279972	-0.013549	0.0	0.0
2	0.002273	0.274838	-0.008789	0.007538	1.032153
3	0.004555	0.273966	-0.000858	0.015106	1.292990
4	0.006867	0.275446	0.007743	0.022773	1.456855
5	0.009244	0.278000	0.014129	0.030656	1.476893
6	0.011730	0.283883	0.019265	0.038900	1.470263
7	0.014384	0.292493	0.023800	0.047702	1.461964
8	0.017271	0.302038	0.028058	0.057276	1.451539
9	0.020464	0.311698	0.032043	0.067865	1.431179
10	0.024046	0.323097	0.035448	0.079744	1.394015
11	0.028102	0.336316	0.038636	0.093194	1.350968
12	0.032724	0.351240	0.042284	0.108522	1.322264
13	0.038007	0.368338	0.046061	0.126042	1.300179
14	0.044048	0.388030	0.049817	0.146076	1.279943
15	0.050945	0.410593	0.053715	0.168949	1.261533
16	0.058796	0.436264	0.058039	0.194985	1.244405
17	0.067697	0.465446	0.062449	0.224503	1.230262
18	0.077742	0.498473	0.066855	0.257815	1.219481
19	0.089022	0.535631	0.071330	0.295223	1.211019
20	0.101623	0.577154	0.076091	0.337012	1.202051
21	0.115622	0.623303	0.081049	0.383436	1.192576
22	0.131092	0.674378	0.085358	0.434740	1.185590
23	0.148098	0.730593	0.090511	0.491136	1.180865
24	0.166692	0.792106	0.096072	0.552800	1.177578
25	0.186918	0.859033	0.099711	0.618875	1.174070
26	0.208807	0.931459	0.104507	0.692465	1.169332

28	0.257630	1.093143	0.113366	0.954377	1.162424
29	0.284555	1.182359	0.117232	0.943668	1.159805
30	0.313123	1.[illegible]034	0.120613	1.038407	1.157077
31	0.343287	1.[illegible]7031	0.123374	1.138440	1.154918
32	0.374981	1.482131	0.125344	1.243546	1.153189
33	0.408119	1.592027	0.126353	1.353442	1.150812
34	0.442592	1.706345	0.126245	1.467765	1.146968
35	0.478271	1.824671	0.124904	1.586086	1.142130
36	0.515000	1.946450	0.122211	1.707891	1.136026
37	0.552599	2.071062	0.117986	1.832591	1.128369
38	0.590864	2.197840	0.112233	1.959478	1.119267
39	0.629560	2.325982	0.105318	2.087806	1.109035
40	0.668427	2.454620	0.097193	2.216700	1.097753
41	0.707171	2.582793	0.088153	2.345186	1.085450
42	0.745470	2.709437	0.078531	2.472197	1.072163
43	0.782969	2.833385	0.068405	2.596555	1.058144
44	0.819281	2.953385	0.058343	2.716576	1.044197
45	0.853981	3.068034	0.048452	2.832051	1.030917
46	0.886611	3.175834	0.039025	2.940262	1.017394
47	0.916674	3.275157	0.030385	3.039960	1.004430
48	0.943639	3.364243	0.022616	3.129383	0.991646
49	0.966931	3.441188	0.015832	3.206627	0.974295
50	0.985936	3.503965	0.010244	3.269652	0.955533
51	1.000000	3.550422	0.006083	3.316294	0.939287

BOUNDARY LAYER PROGRAM OUTPUT FOLLOWS

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

TRFLAG =1 TRINT =0 TVC =0 SHORTP =1

TRANSITION SPECIFIED AT STATION 10000

BODY GEOMETRY DATA

K	X/C	Y/C	X	S	S/C
1	0.2799721E+00	-0.1354950E-01	0.2799721E+00	0.0	0.0
2	0.2748379E+00	-0.8789178E-02	0.2748379E+00	0.7537935E-02	0.7537935E-02
3	0.2739658E+00	-0.8578151E-03	0.2739658E+00	0.1510572E-01	0.1510572E-01
4	0.2754462E+00	0.7742841E-02	0.2754462E+00	0.2277298E-01	0.2277298E-01
5	0.2780001E+00	0.1412999E-01	0.2780001E+00	0.3065581E-01	0.3065581E-01
6	0.2838829E+00	0.1926542E-01	0.2838829E+00	0.3890013E-01	0.3890013E-01
7	0.2924929E+00	0.2279953E-01	0.2924929E+00	0.4770157E-01	0.4770157E-01
8	0.3020384E+00	0.2805790E-01	0.3020384E+00	0.5727571E-01	0.5727571E-01
9	0.3116979E+00	0.3204341E-01	0.3116979E+00	0.6786460E-01	0.6786460E-01
10	0.3230972E+00	0.3544843E-01	0.3230972E+00	0.7974356E-01	0.7974356E-01
11	0.3363163E+00	0.3863586E-01	0.3363163E+00	0.9319443E-01	0.9319443E-01
12	0.3512401E+00	0.4228381E-01	0.3512401E+00	0.1085224E+00	0.1085224E+00
13	0.3683381E+00	0.4606129E-01	0.3683381E+00	0.1260424E+00	0.1260424E+00
14	0.3880301E+00	0.4981668E-01	0.3880301E+00	0.1460761E+00	0.1460761E+00
15	0.4105932E+00	0.5371492E-01	0.4105932E+00	0.1689485E+00	0.1689485E+00
16	0.4362644E+00	0.5803761E-01	0.4362644E+00	0.1949848E+00	0.1949848E+00
17	0.4654456E+00	0.6244992E-01	0.4654456E+00	0.2245030E+00	0.2245030E+00
18	0.4984731E+00	0.6685466E-01	0.4984731E+00	0.2578152E+00	0.2578152E+00
19	0.5356305E+00	0.7132983E-01	0.5356305E+00	0.2952230E+00	0.2952230E+00
20	0.5771537E+00	0.7609111E-01	0.5771537E+00	0.3370117E+00	0.3370117E+00
21	0.6233026E+00	0.8104891E-01	0.6233026E+00	0.3834364E+00	0.3834364E+00
22	0.6743783E+00	0.8585817E-01	0.6743783E+00	0.4347396E+00	0.4347396E+00
23	0.7305933E+00	0.9051090E-01	0.7305933E+00	0.4911364E+00	0.4911364E+00
24	0.7921064E+00	0.9507161E-01	0.7921064E+00	0.5527996E+00	0.5527996E+00
25	0.8590326E+00	0.9971070E-01	0.8590326E+00	0.6198750E+00	0.6198750E+00
26	0.9314590E+00	0.1045071E+00	0.9314590E+00	0.6924653E+00	0.6924653E+00
27	0.1009490E+01	0.1090945E+00	0.1009490E+01	0.7706270E+00	0.7706270E+00
28	0.1093143E+01	0.1133659E+00	0.1093143E+01	0.8543767E+00	0.8543767E+00
29	0.1182359E+01	0.1172323E+00	0.1182359E+01	0.9436680E+00	0.9436680E+00
30	0.1277034E+01	0.1206126E+00	0.1277034E+01	0.1038407E+01	0.1038407E+01
31	0.1377031E+01	0.1233739E+00	0.1377031E+01	0.1138440E+01	0.1138440E+01
32	0.1482131E+01	0.1253439E+00	0.1482131E+01	0.1243546E+01	0.1243546E+01
33	0.1592027E+01	0.1263531E+00	0.1592027E+01	0.1353442E+01	0.1353442E+01
34	0.1706345E+01	0.1262447E+00	0.1706345E+01	0.1467765E+01	0.1467765E+01
35	0.1824671E+01	0.1249044E+00	0.1824671E+01	0.1586086E+01	0.1586086E+01

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

BODY GEOMETRY DATA

K	X/C	Y/C	X	S	S/C
36	0.1946450E+01	0.1222114E+00	0.1946450E+01	0.1707891E+01	0.1707891E+01
37	0.2071062E+01	0.1179858E+00	0.2071062E+01	0.1832581E+01	0.1832581E+01
38	0.2197340E+01	0.1122328E+00	0.2197840E+01	0.1959478E+01	0.1959478E+01
39	0.2325932E+01	0.1053176E+00	0.2325982E+01	0.2087806E+01	0.2087806E+01
40	0.2456420E+01	0.9719348E-01	0.2456620E+01	0.2216700E+01	0.2216700E+01
41	0.2582793E+01	0.8815306E-01	0.2582793E+01	0.2345196E+01	0.2345196E+01
42	0.2709437E+01	0.7853144E-01	0.2709437E+01	0.2472197E+01	0.2472197E+01
43	0.2833385E+01	0.6840533E-01	0.2833385E+01	0.2596555E+01	0.2596555E+01
44	0.2953385E+01	0.5834335E-01	0.2953385E+01	0.2716976E+01	0.2716976E+01
45	0.3058034E+01	0.4845215E-01	0.3058034E+01	0.2832051E+01	0.2832051E+01
46	0.3175834E+01	0.3902541E-01	0.3175834E+01	0.2940262E+01	0.2940262E+01
47	0.3275157E+01	0.3038535E-01	0.3275157E+01	0.3039960E+01	0.3039960E+01
48	0.3364243E+01	0.2261624E-01	0.3364243E+01	0.3129383E+01	0.3129383E+01
49	0.3441188E+01	0.1583154E-01	0.3441188E+01	0.3206627E+01	0.3206627E+01
50	0.3503965E+01	0.1024423E-01	0.3503965E+01	0.3269652E+01	0.3269652E+01
51	0.3550422E+01	0.6083012E-02	0.3550422E+01	0.3316294E+01	0.3316294E+01

REFERENCE QUANTITIES AND CONTROL PARAMETERS

H1 =	0.00500	C =	0.1000000E+01	PRO =	0.72000
K =	1.14000	RHOREF =	0.1110765E-01	SWEEP =	0.0
KK =	0.0	MUREF =	0.3700334E-06	HE =	0.3157074E+07
EPSI =	0.4399399E-02	VREF =	0.2231995E+03	TREF =	519.000
		REY =	0.6700000E+07	MREF =	0.1995391E+00

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

STATION DATA

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	EW EPW SQUIG
0.279972E+00	-0.135495E-01	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.100000E+01	0.370033E-06	0.0
0.100000E+01	0.0	0.0	0.0	0.0	0.0
0.274338E+00	-0.878918E-02	0.0	0.230376E+03	0.0	0.0
0.753793E-02	0.0	0.0	-0.653391E-01	0.370033E-06	0.0
0.100000E+01	0.0	0.0	0.0	0.0	0.356881E-08
0.273766E+00	-0.857815E-03	0.0	0.288594E+03	0.0	0.0
0.151257E-01	0.0	0.0	-0.671820E+00	0.370033E-06	0.0
0.424435E+00	0.0	0.0	0.0	0.0	0.116401E-07
0.275446E+00	0.774284E-02	0.0	0.325169E+03	0.0	0.0
0.227730E-01	0.0	0.0	-0.112242E+01	0.370033E-06	0.0
0.264500E+00	0.0	0.0	0.0	0.0	0.213112E-07
0.278000E+00	0.141290E-01	0.0	0.329642E+03	0.0	0.0
0.306353E-01	0.0	0.0	-0.118121E+01	0.370033E-06	0.0
0.289166E-01	0.0	0.0	0.0	0.0	0.319191E-07
0.283833E+00	0.192654E-01	0.0	0.328162E+03	0.0	0.0
0.389001E-01	0.0	0.0	-0.116167E+01	0.370033E-06	0.0
-0.378132E-01	0.0	0.0	0.0	0.0	0.430642E-07
0.292493E+00	0.237995E-01	0.0	0.326309E+03	0.0	0.0
0.477116E-01	0.0	0.0	-0.113733E+01	0.370033E-06	0.0
-0.567109E-01	0.0	0.0	0.0	0.0	0.549022E-07
0.302033E+00	0.280579E-01	0.0	0.323983E+03	0.0	0.0
0.572757E-01	0.0	0.0	-0.110696E+01	0.370033E-06	0.0
-0.103956E+00	0.0	0.0	0.0	0.0	0.676972E-07
0.311698E+00	0.320434E-01	0.0	0.319438E+03	0.0	0.0
0.678546E-01	0.0	0.0	-0.104827E+01	0.370033E-06	0.0
-0.216507E+00	0.0	0.0	0.0	0.0	0.816988E-07
0.323097E+00	0.354484E-01	0.0	0.311144E+03	0.0	0.0
0.797436E-01	0.0	0.0	-0.943277E+00	0.370033E-06	0.0
-0.344435E+00	0.0	0.0	0.0	0.0	0.970929E-07
0.336316E+00	0.386359E-01	0.0	0.301535E+03	0.0	0.0
0.931944E-01	0.0	0.0	-0.825113E+00	0.370033E-06	0.0
-0.361390E+00	0.0	0.0	0.0	0.0	0.114029E-06

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	EW EPW SQUIG
0.351240E+00	0.422838E-01	0.0	0.295128E+03	0.0	0.0
0.108522E+00	0.0	0.0	-0.748378E+00	0.370033E-06	0.0
-0.262353E+00	0.0	0.0	0.0	0.0	0.132824E-06
0.368338E+00	0.460613E-01	0.0	0.290199E+03	0.0	0.0
0.126042E+00	0.0	0.0	-0.690461E+00	0.370033E-06	0.0
-0.226983E+00	0.0	0.0	0.0	0.0	0.153899E-06
0.388030E+00	0.498167E-01	0.0	0.285683E+03	0.0	0.0
0.146076E+00	0.0	0.0	-0.638252E+00	0.370033E-06	0.0
-0.216036E+00	0.0	0.0	0.0	0.0	0.177609E-06
0.410522E+00	0.537149E-01	0.0	0.281573E+03	0.0	0.0
0.168349E+00	0.0	0.0	-0.591464E+00	0.370033E-06	0.0
-0.205779E+00	0.0	0.0	0.0	0.0	0.204273E-06
0.436264E+00	0.580376E-01	0.0	0.277750E+03	0.0	0.0
0.194335E+00	0.0	0.0	-0.548542E+00	0.370033E-06	0.0
-0.189230E+00	0.0	0.0	0.0	0.0	0.234201E-06
0.465446E+00	0.624489E-01	0.0	0.274594E+03	0.0	0.0
0.224503E+00	0.0	0.0	-0.513542E+00	0.370033E-06	0.0
-0.156535E+00	0.0	0.0	0.0	0.0	0.267707E-06
0.498473E+00	0.668547E-01	0.0	0.272187E+03	0.0	0.0
0.257315E+00	0.0	0.0	-0.487129E+00	0.370033E-06	0.0
-0.124244E+00	0.0	0.0	0.0	0.0	0.305140E-06
0.535531E+00	0.713298E-01	0.0	0.270299E+03	0.0	0.0
0.295223E+00	0.0	0.0	-0.466563E+00	0.370033E-06	0.0
-0.113301E+00	0.0	0.0	0.0	0.0	0.346844E-06
0.577154E+00	0.760911E-01	0.0	0.268297E+03	0.0	0.0
0.337012E+00	0.0	0.0	-0.444924E+00	0.370033E-06	0.0
-0.124321E+00	0.0	0.0	0.0	0.0	0.393099E-06
0.623303E+00	0.810489E-01	0.0	0.266182E+03	0.0	0.0
0.333436E+00	0.0	0.0	-0.422235E+00	0.370033E-06	0.0
-0.116067E+00	0.0	0.0	0.0	0.0	0.444092E-06
0.674378E+00	0.858582E-01	0.0	0.264623E+03	0.0	0.0
0.434740E+00	0.0	0.0	-0.405622E+00	0.370033E-06	0.0
-0.852502E-01	0.0	0.0	0.0	0.0	0.500057E-06
0.730533E+00	0.905109E-01	0.0	0.263568E+03	0.0	0.0
0.421136E+00	0.0	0.0	-0.394440E+00	0.370033E-06	0.0
-0.607463E-01	0.0	0.0	0.0	0.0	0.561275E-06

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	EW EPW SQUIG
0.792106E+00	0.950716E-01	0.0	0.262835E+03	0.0	0.0
0.552300E+00	0.0	0.0	-0.386689E+00	0.370033E-06	0.0
-0.519147E-01	0.0	0.0	0.0	0.0	0.627983E-06
0.859033E+00	0.997107E-01	0.0	0.262052E+03	0.0	0.0
0.619375E+00	0.0	0.0	-0.278438E+00	0.370033E-06	0.0
-0.647982E-01	0.0	0.0	0.0	0.0	0.700336E-06
0.931459E+00	0.104507E+00	0.0	0.260994E+03	0.0	0.0
0.692465E+00	0.0	0.0	-0.367334E+00	0.370033E-06	0.0
-0.714327E-01	0.0	0.0	0.0	0.0	0.778365E-06
0.100243E+01	0.109095E+00	0.0	0.260134E+03	0.0	0.0
0.770527E+00	0.0	0.0	-0.358332E+00	0.370033E-06	0.0
-0.794330E-01	0.0	0.0	0.0	0.0	0.862073E-06
0.108314E+01	0.113366E+00	0.0	0.259452E+03	0.0	0.0
0.854377E+00	0.0	0.0	-0.351228E+00	0.370033E-06	0.0
-0.874333E-01	0.0	0.0	0.0	0.0	0.951501E-06
0.116236E+01	0.117232E+00	0.0	0.258868E+03	0.0	0.0
0.943668E+00	0.0	0.0	-0.345146E+00	0.370033E-06	0.0
-0.492590E-01	0.0	0.0	0.0	0.0	0.104661E-05
0.127703E+01	0.120613E+00	0.0	0.258259E+03	0.0	0.0
0.1033415+01	0.0	0.0	-0.338823E+00	0.370033E-06	0.0
-0.472537E-01	0.0	0.0	0.0	0.0	0.114730E-05
0.137703E+01	0.123374E+00	0.0	0.257777E+03	0.0	0.0
0.113844E+01	0.0	0.0	-0.333832E+00	0.370033E-06	0.0
-0.390818E-01	0.0	0.0	0.0	0.0	0.125338E-05
0.148213E+01	0.125344E+00	0.0	0.257391E+03	0.0	0.0
0.124355E+01	0.0	0.0	-0.329843E+00	0.370033E-06	0.0
-0.424545E-01	0.0	0.0	0.0	0.0	0.136466E-05
0.159203E+01	0.126353E+00	0.0	0.256861E+03	0.0	0.0
0.135344E+01	0.0	0.0	-0.324366E+00	0.370033E-06	0.0
-0.670501E-01	0.0	0.0	0.0	0.0	0.148080E-05
0.170634E+01	0.126245E+00	0.0	0.256002E+03	0.0	0.0
0.146776E+01	0.0	0.0	-0.315533E+00	0.370033E-06	0.0
-0.986977E-01	0.0	0.0	0.0	0.0	0.160129E-05
0.182467E+01	0.124904E+00	0.0	0.254923E+03	0.0	0.0
0.158509E+01	0.0	0.0	-0.304461E+00	0.370033E-06	0.0
-0.131004E+00	0.0	0.0	0.0	0.0	0.172553E-05

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C / S / BETA	RO/C / ALPHA1 / ALPHA2	TW / QW / RR	UE / CP / ME	PE / MUE / TE	FW / FPW / SQUIG
0.194645E+01	0.122211E+00	0.0	0.253561E+03	0.0	0.0
0.170789E+01	0.0	0.0	-0.290555E+00	0.370033E-06	0.0
-0.174310E+00	0.0	0.0	0.0	0.0	0.185281E-05
0.207106E+01	0.117986E+00	0.0	0.251851E+03	0.0	0.0
0.183258E+01	0.0	0.0	-0.273217E+00	0.370033E-06	0.0
-0.225794E+00	0.0	0.0	0.0	0.0	0.198233E-05
0.219734E+01	0.112233E+00	0.0	0.249820E+03	0.0	0.0
0.195949E+01	0.0	0.0	-0.252759E+00	0.370033E-06	0.0
-0.278402E+00	0.0	0.0	0.0	0.0	0.211316E-05
0.232598E+01	0.105318E+00	0.0	0.247536E+03	0.0	0.0
0.208731E+01	0.0	0.0	-0.229959E+00	0.370033E-06	0.0
-0.332667E+00	0.0	0.0	0.0	0.0	0.224432E-05
0.245462E+01	0.971935E-01	0.0	0.245018E+03	0.0	0.0
0.221670E+01	0.0	0.0	-0.205060E+00	0.370033E-06	0.0
-0.393744E+00	0.0	0.0	0.0	0.0	0.237479E-05
0.258278E+01	0.881531E-01	0.0	0.242272E+03	0.0	0.0
0.234513E+01	0.0	0.0	-0.178202E+00	0.370033E-06	0.0
-0.464194E+00	0.0	0.0	0.0	0.0	0.250346E-05
0.270344E+01	0.785314E-01	0.0	0.239306E+03	0.0	0.0
0.247220E+01	0.0	0.0	-0.149532E+00	0.370033E-06	0.0
-0.542186E+00	0.0	0.0	0.0	0.0	0.262916E-05
0.283333E+01	0.684053E-01	0.0	0.236177E+03	0.0	0.0
0.259455E+01	0.0	0.0	-0.119667E+00	0.370033E-06	0.0
-0.612151E+00	0.0	0.0	0.0	0.0	0.275068E-05
0.295339E+01	0.583434E-01	0.0	0.233064E+03	0.0	0.0
0.271598E+01	0.0	0.0	-0.903473E-01	0.370033E-06	0.0
-0.662637E+00	0.0	0.0	0.0	0.0	0.286681E-05
0.306303E+01	0.484522E-01	0.0	0.230100E+03	0.0	0.0
0.283205E+01	0.0	0.0	-0.627899E-01	0.370033E-06	0.0
-0.734669E+00	0.0	0.0	0.0	0.0	0.297634E-05
0.317593E+01	0.390254E-01	0.0	0.227082E+03	0.0	0.0
0.294126E+01	0.0	0.0	-0.350904E-01	0.370033E-06	0.0
-0.827245E+00	0.0	0.0	0.0	0.0	0.307801E-05
0.327516E+01	0.303853E-01	0.0	0.224188E+03	0.0	0.0
0.303996E+01	0.0	0.0	-0.887871E-02	0.370033E-06	0.0
-0.937541E+00	0.0	0.0	0.0	0.0	0.317047E-05

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

X/C S BETA	RO/C ALPHA1 ALPHA2	TW QW RR	UE CP ME	PE MUE TE	FW FPW SQUIG
0.336424E+01	0.226162E-01	0.0	0.221335E+03	0.0	0.0
0.312938E+01	0.0	0.0	0.166376E-01	0.370033E-06	0.0
-0.134673E+01	0.0	0.0	0.0	0.0	0.325235E-05
0.344119E+01	0.158315E-01	0.0	0.217462E+03	0.0	0.0
0.320663E+01	0.0	0.0	0.507497E-01	0.370033E-06	0.0
-0.202076E+01	0.0	0.0	0.0	0.0	0.332200E-05
0.350337E+01	0.102442E-01	0.0	0.213274E+03	0.0	0.0
0.326965E+01	0.0	0.0	0.869575E-01	0.370033E-06	0.0
-0.263547E+01	0.0	0.0	0.0	0.0	0.337779E-05
0.355042E+01	0.608301E-02	0.0	0.209648E+03	0.0	0.0
0.331629E+01	0.0	0.0	0.117739E+00	0.370033E-06	0.0
-0.294202E+01	0.0	0.0	0.0	0.0	0.341833E-05

LAMINAR SEPARATION OCCURRED AT S = 0.093177

TURBULENT FLOW STARTED WITH NTR = 11

PROGRAM J1HA — L JGLAS AIRCRAFT COMPANY — PAGE 166.
CASE NO. NACA — LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

OUTPUT SUMMARY

N / C	S / RX	THETA / RTHETA	DELS / H	CF / CFA	FPPW / GPW	GW / ST	IMAX / ETAINF
1	0.0	0.0	0.0	0.0	0.123317E+01	0.0	41
79972	0.0	0.0	0.138494E+01	0.0	0.0	0.0	6.710110
2	0.753793E-02	0.962572E-05	0.213922E-04	0.108023E-01	0.123317E+01	0.0	45
74838	0.521280E+05	0.665936E+02	0.222148E+01	-0.375123E-02	0.0	0.0	11.357721
3	0.151057E-01	0.156570E-04	0.364760E-04	0.454457E-02	0.936949E+00	0.0	41
73966	0.130361E+05	0.135637E+03	0.232969E+01	-0.181954E-02	0.0	0.0	6.710110
4	0.227730E-01	0.207205E-04	0.498321E-04	0.279512E-02	0.779737E+00	0.0	41
75446	0.222285E+05	0.202251E+03	0.240497E+01	-0.462755E-02	0.0	0.0	6.710110
5	0.306558E-01	0.269435E-04	0.672918E-04	0.183355E-02	0.625982E+00	0.0	40
78000	0.303345E+05	0.266611E+03	0.249751E+01	-0.170520E-01	0.0	0.0	5.881675
6	0.389031E-01	0.334856E-04	0.871086E-04	0.129423E-02	0.513233E+00	0.0	42
83883	0.383195E+05	0.329859E+03	0.260137E+01	0.137103E-01	0.0	0.0	7.654526
7	0.477016E-01	0.395762E-04	0.104223E-03	0.106580E-02	0.477215E+00	0.0	42
92493	0.467244E+06	0.387654E+03	0.263348E+01	0.602750E-02	0.0	0.0	7.654526
8	0.572757E-01	0.457011E-04	0.123137E-03	0.843112E-03	0.419194E+00	0.0	42
02038	0.557023E+05	0.444457E+03	0.269441E+01	0.429704E-02	0.0	0.0	7.654526
9	0.678646E-01	0.528945E-04	0.149879E-03	0.580258E-03	0.316938E+00	0.0	41
11698	0.650746E+05	0.507199E+03	0.283354E+01	0.344009E-02	0.0	0.0	6.710110
0	0.797436E-01	0.622842E-04	0.201218E-03	0.216334E-03	0.128814E+00	0.0	42
23097	0.744797E+05	0.581728E+03	0.323065E+01	0.274341E-02	0.0	0.0	7.654526
1	0.931944E-01	0.837488E-04	0.139411E-03	0.328862E-02	0.212210E+01	0.0	43
36316	0.843548E+05	0.758051E+03	0.166463E+01	0.285317E-02	0.0	0.0	8.731161
2	0.108522E+00	0.120915E-03	0.174824E-03	0.426693E-02	0.297165E+01	0.0	49
51240	0.961416E+05	0.107120E+04	0.144585E+01	0.366524E-02	0.0	0.0	19.207336
3	0.126042E+00	0.163997E-03	0.238124E-03	0.365034E-02	0.273650E+01	0.0	49
68338	0.109798E+07	0.142861E+04	0.145200E+01	0.427477E-02	0.0	0.0	19.207336
4	0.146076E+00	0.209804E-03	0.299725E-03	0.350233E-02	0.282055E+01	0.0	50
88030	0.125269E+07	0.179920E+04	0.142859E+01	0.458083E-02	0.0	0.0	21.901352
5	0.168949E+00	0.260331E-03	0.368416E-03	0.329975E-02	0.284991E+01	0.0	50
10593	0.142301E+07	0.220039E+04	0.141518E+01	0.473867E-02	0.0	0.0	21.901352

124

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N C/C	S RX	THETA RTHETA	DELS H	CF CFA	FPPW GPW	GW ST	IMAX ETAINF
6	0.194985E+00	0.315825E-03	0.442778E-03	0.320749E-02	0.296623E+01	0.0	53
.36264	0.162569E+07	0.263320E+04	0.140197E+01	0.479952E-02	0.0	0.0	32.464981
7	0.224503E+00	0.375568E-03	0.522825E-03	0.307941E-02	0.304468E+01	0.0	51
.65446	0.185052E+07	0.309572E+04	0.139209E+01	0.480178E-02	0.0	0.0	24.972534
8	0.257815E+00	0.438723E-03	0.605966E-03	0.302178E-02	0.318974E+01	0.0	52
.98473	0.210649E+07	0.358459E+04	0.138120E+01	0.476785E-02	0.0	0.0	28.473679
9	0.295223E+00	0.506109E-03	0.694764E-03	0.293162E-02	0.329928E+01	0.0	54
35631	0.239534E+07	0.410647E+04	0.137276E+01	0.471389E-02	0.0	0.0	37.015076
0	0.337012E+00	0.580261E-03	0.791906E-03	0.287298E-02	0.344214E+01	0.0	53
.77154	0.271420E+07	0.467326E+04	0.136474E+01	0.464562E-02	0.0	0.0	32.464981
1	0.383436E+00	0.661618E-03	0.898872E-03	0.279722E-02	0.356211E+01	0.0	55
.23303	0.316375E+07	0.528649E+04	0.135860E+01	0.456754E-02	0.0	0.0	42.202179
2	0.433474E+00	0.746764E-03	0.100918E-02	0.275239E-02	0.371932E+01	0.0	54
74378	0.345333E+07	0.593187E+04	0.135140E+01	0.448415E-02	0.0	0.0	37.015076
3	0.491136E+00	0.834600E-03	0.112220E-02	0.270617E-02	0.387424E+01	0.0	56
.30593	0.388576E+07	0.660317E+04	0.134460E+01	0.440145E-02	0.0	0.0	48.115479
4	0.552800E+00	0.926302E-03	0.123932E-02	0.266846E-02	0.404091E+01	0.0	55
.92106	0.436146E+07	0.730830E+04	0.133792E+01	0.432163E-02	0.0	0.0	42.202179
5	0.619875E+00	0.102509E-02	0.136612E-02	0.262391E-02	0.419611E+01	0.0	56
59033	0.487610E+07	0.806364E+04	0.133268E+01	0.424500E-02	0.0	0.0	48.115479
6	0.692465E+00	0.113282E-02	0.150445E-02	0.257982E-02	0.434936E+01	0.0	56
.31459	0.542513E+07	0.837506E+04	0.132806E+01	0.417021E-02	0.0	0.0	48.115479
7	0.770527E+00	0.124593E-02	0.164942E-02	0.254242E-02	0.451091E+01	0.0	57
.09490	0.601758E+07	0.972904E+04	0.132385E+01	0.409750E-02	0.0	0.0	54.856644
8	0.854377E+00	0.136312E-02	0.179860E-02	0.250621E-02	0.467161E+01	0.0	57
93143	0.665403E+07	0.106163E+05	0.131947E+01	0.402780E-02	0.0	0.0	54.856644
9	0.943668E+00	0.148527E-02	0.195377E-02	0.247640E-02	0.484127E+01	0.0	57
82359	0.733295E+07	0.115415E+05	0.131543E+01	0.396166E-02	0.0	0.0	54.856644
0	0.103341E+01	0.161323E-02	0.211620E-02	0.244278E-02	0.499996E+01	0.0	58
77034	0.805015E+07	0.125064E+05	0.131177E+01	0.389890E-02	0.0	0.0	62.541580

PROGRAM JIHA — LONG BEACH DIVISION — PAGE 168.
CASE NO. NACA — MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N X/C	S RX	THETA RTHETA	DELS H	CF CFA	FPPW GPW	GW ST	IMAX ETAINF
31 377031	0.113944E+01 0.880918E+07	0.174514E-02 0.135038E+05	0.228319E-02 0.130831E+01	0.241654E-02 0.383947E-02	0.516987E+01 0.0	0.0 0.0	58 62.541580
32 482131	0.124355E+01 0.960809E+07	0.189119E-02 0.145348E+05	0.245506E-02 0.130505E+01	0.238668E-02 0.378343E-02	0.532783E+01 0.0	0.0 0.0	58 62.541580
33 592027	0.135344E+01 0.104356E+03	0.202557E-02 0.156180E+05	0.263840E-02 0.130255E+01	0.235930E-02 0.373031E-02	0.548624E+01 0.0	0.0 0.0	59 71.302399
34 706345	0.146776E+01 0.112793E+03	0.218203E-02 0.167682E+05	0.283864E-02 0.130092E+01	0.232301E-02 0.367902E-02	0.561734E+01 0.0	0.0 0.0	59 71.302399
35 824671	0.158509E+01 0.121372E+03	0.235034E-02 0.179854E+05	0.305517E-02 0.129989E+01	0.229068E-02 0.362869E-02	0.575004E+01 0.0	0.0 0.0	59 71.302399
36 946450	0.170789E+01 0.129994E+03	0.253212E-02 0.192729E+05	0.329039E-02 0.129946E+01	0.225199E-02 0.357889E-02	0.585771E+01 0.0	0.0 0.0	59 71.302399
37 071062	0.183258E+01 0.138544E+03	0.272997E-02 0.206387E+05	0.354822E-02 0.129973E+01	0.221623E-02 0.352915E-02	0.596276E+01 0.0	0.0 0.0	60 81.289734
38 97840	0.195948E+01 0.146943E+03	0.294437E-02 0.220801E+05	0.383053E-02 0.130097E+01	0.218447E-02 0.347958E-02	0.606815E+01 0.0	0.0 0.0	60 81.289734
9 25982	0.208781E+01 0.155135E+03	0.317532E-02 0.235943E+05	0.413910E-02 0.130352E+01	0.214603E-02 0.343000E-02	0.614361E+01 0.0	0.0 0.0	60 81.289734
0 54620	0.221670E+01 0.163037E+03	0.342274E-02 0.251740E+05	0.447137E-02 0.130637E+01	0.209424E-02 0.337982E-02	0.616713E+01 0.0	0.0 0.0	60 81.289734
1 682793	0.234519E+01 0.170554E+03	0.368793E-02 0.268205E+05	0.482860E-02 0.130930E+01	0.205706E-02 0.332938E-02	0.621958E+01 0.0	0.0 0.0	60 81.289734
2 809437	0.247220E+01 0.177590E+03	0.397197E-02 0.285326E+05	0.521487E-02 0.131292E+01	0.200630E-02 0.327910E-02	0.621654E+01 0.0	0.0 0.0	61 92.675308
3 933385	0.259655E+01 0.184034E+03	0.427280E-02 0.302922E+05	0.562621E-02 0.131675E+01	0.196758E-02 0.322937E-02	0.623585E+01 0.0	0.0 0.0	61 92.675308
4 053385	0.271698E+01 0.190083E+03	0.458247E-02 0.320595E+05	0.605247E-02 0.132079E+01	0.192225E-02 0.318090E-02	0.621947E+01 0.0	0.0 0.0	61 92.675308
5 68034	0.283205E+01 0.195614E+03	0.489533E-02 0.333127E+05	0.648436E-02 0.132460E+01	0.188209E-02 0.313432E-02	0.620479E+01 0.0	0.0 0.0	61 92.675308

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N / X/C	S / RX	THETA / RTHETA	DELS / H	CF / CFA	FPPW / GPW	GW / ST	IMAX / ETAINF
46	0.294026E+01	0.521573E-02	0.693160E-02	0.184526E-02	0.618638E+01	0.0	61
175834	0.200424E+03	0.355532E+05	0.132898E+01	0.309042E-02	0.0	0.0	92.675308
47	0.303986E+01	0.553769E-02	0.738680E-02	0.179990E-02	0.612429E+01	0.0	61
275157	0.204579E+03	0.372669E+05	0.133391E+01	0.304972E-02	0.0	0.0	92.675308
48	0.312938E+01	0.588286E-02	0.789164E-02	0.174906E-02	0.602765E+01	0.0	61
364243	0.207917E+03	0.390858E+05	0.134146E+01	0.301269E-02	0.0	0.0	92.675308
49	0.320663E+01	0.631180E-02	0.854577E-02	0.163486E-02	0.569411E+01	0.0	61
441188	0.209321E+03	0.412026E+05	0.135391E+01	0.297918E-02	0.0	0.0	92.675308
50	0.326965E+01	0.678955E-02	0.930031E-02	0.153371E-02	0.538647E+01	0.0	61
503965	0.209325E+03	0.434671E+05	0.136980E+01	0.294991E-02	0.0	0.0	92.675308
51	0.331629E+01	0.722123E-02	0.100010E-01	0.144673E-02	0.511139E+01	0.0	61
550422	0.208702E+03	0.454448E+05	0.138494E+01	0.292702E-02	0.0	0.0	92.675308

I	SM (I)	VB (I)	DEL (I)
1	0.0	0.0	0.0
2	0.416265E-02	0.901386E+00	0.125991E-04
3	0.267184E-01	0.147966E+01	0.582438E-04
4	0.581325E-01	0.145054E+01	0.125038E-03
5	0.101938E+00	0.133184E+01	0.152376E-03
6	0.181487E+00	0.125280E+01	0.404701E-03
7	0.336468E+00	0.120218E+01	0.790647E-03
8	0.635281E+00	0.117303E+01	0.139546E-02
9	0.101817E+01	0.115766E+01	0.208181E-02
10	0.138220E+01	0.114994E+01	0.268738E-02
11	0.172805E+01	0.113484E+01	0.333270E-02
12	0.206007E+01	0.111132E+01	0.407051E-02
13	0.237665E+01	0.108228E+01	0.492119E-02
14	0.267960E+01	0.104851E+01	0.591733E-02
15	0.296975E+01	0.101336E+01	0.705972E-02
16	0.318036E+01	0.981033E+00	0.829350E-02
17	0.331629E+01	0.939287E+00	0.100010E-01

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

THE NEW RIGHT - HAND SIDE

0.237167E-02	0.219190E-02	0.198597E-02	0.192399E-02	0.749296E-03	-0.106619E-03	0.282248E-03	0.249396E-03
0.269210E-03	0.362722E-03	0.534990E-03	0.723518E-03	0.123489E-02	0.181338E-02	0.282001E-02	0.319733E-02
0.197032E-02	0.167492E-02	0.349652E-02	0.266883E-02	0.217530E-02	0.194290E-02	0.193331E-02	0.211927E-02
0.239048E-02	0.272091E-02	0.309011E-02	0.407872E-02	0.745158E-02	0.110509E-01		

STRIP NO.	C. POINT	X	Z	V	S	DEL	DQDS
4	1	0.355042E+01	-0.608301E-02	0.939505E+00	0.328541E+01	0.267961E-02	0.237167E-02
4	2	0.341502E+01	-0.181485E-01	0.956792E+00	0.314947E+01	0.230700E-02	0.219190E-02
4	3	0.320522E+01	-0.364645E-01	0.975921E+00	0.293887E+01	0.181883E-02	0.198597E-02
4	4	0.291615E+01	-0.614836E-01	0.990338E+00	0.264872E+01	0.123741E-02	0.192399E-02
4	5	0.261417E+01	-0.858492E-01	0.993763E+00	0.234577E+01	0.633911E-03	0.749296E-03
4	6	0.229329E+01	-0.106897E+00	0.100097E+01	0.202919E+01	0.794075E-03	-0.106619E-03
4	7	0.196750E+01	-0.121610E+00	0.993938E+00	0.169807E+01	0.694369E-03	0.282248E-03
4	8	0.162078E+01	-0.126436E+00	0.972688E+00	0.135132E+01	0.621583E-03	0.249396E-03
4	9	0.125681E+01	-0.119951E+00	0.943099E+00	0.987287E+00	0.543739E-03	0.269210E-03
4	10	0.874401E+00	-0.100763E+00	0.900705E+00	0.604400E+00	0.447282E-03	0.362722E-03
4	11	0.576618E+00	-0.760292E-01	0.857498E+00	0.305591E+00	0.322961E-03	0.534990E-03
4	12	0.422954E+00	-0.558196E-01	0.812320E+00	0.150604E+00	0.227535E-03	0.723518E-03
4	13	0.344856E+00	-0.407042E-01	0.764277E+00	0.710570E-01	0.159600E-03	0.123489E-02
4	14	0.302808E+00	-0.284209E-01	0.728941E+00	0.272515E-01	0.737490E-04	0.181338E-02
4	15	0.276484E+00	-0.112779E-01	0.901386E+00	0.416265E-02	0.125991E-04	0.282001E-02
4	16	0.276484E+00	0.112779E-01	0.147966E+01	0.267184E-01	0.582438E-04	0.319733E-02
4	17	0.302808E+00	0.284209E-01	0.145054E+01	0.581325E-01	0.125038E-03	0.197032E-02
4	18	0.344856E+00	0.407042E-01	0.133184E+01	0.101938E+00	0.152376E-03	0.167492E-02
4	19	0.422956E+00	0.558196E-01	0.125280E+01	0.181487E+00	0.404701E-03	0.349652E-02
4	20	0.576614E+00	0.760292E-01	0.120218E+01	0.336468E+00	0.790647E-03	0.266883E-02
4	21	0.874401E+00	0.100763E+00	0.117303E+01	0.635281E+00	0.139546E-02	0.217530E-02
4	22	0.125681E+01	0.119951E+00	0.115766E+01	0.101817E+01	0.208181E-02	0.194290E-02
4	23	0.162078E+01	0.126436E+00	0.114094E+01	0.138220E+01	0.268788E-02	0.193331E-02
4	24	0.196750E+01	0.121610E+00	0.113484E+01	0.172895E+01	0.333270E-02	0.211927E-02
4	25	0.229329E+01	0.106897E+00	0.111132E+01	0.206007E+01	0.407051E-02	0.239048E-02
4	26	0.261417E+01	0.858491E-01	0.108228E+01	0.237665E+01	0.492119E-02	0.272091E-02
4	27	0.291615E+01	0.614836E-01	0.104851E+01	0.267960E+01	0.591733E-02	0.309011E-02
4	28	0.320522E+01	0.364645E-01	0.101336E+01	0.296975E+01	0.705972E-02	0.407872E-02
4	29	0.341502E+01	0.181485E-01	0.981033E+00	0.318036E+01	0.829350E-02	0.745158E-02
4	30	0.355042E+01	0.608301E-02	0.939287E+00	0.331629E+01	0.100010E-01	0.110509E-01

THE NEW RIGHT - HAND SIDE

0.301943E-02	0.255706E-02	0.212835E-02	0.206386E-02	0.980205E-03	0.167244E-03	0.450903E-03	0.364276E-03
0.367211E-03	0.421921E-03	0.550590E-03	0.674164E-03	0.200145E-02	0.298983E-02	0.293589E-02	0.287229E-02
0.430720E-02	0.375147E-02	0.467763E-02	0.350818E-02	0.282221E-02	0.256789E-02	0.250652E-02	0.265491E-02
0.283370E-02	0.293230E-02	0.302511E-02	0.356354E-02	0.598880E-02	0.959261E-02	0.263158E-02	0.232872E-02
0.203744E-02	0.195833E-02	0.649566E-03	-0.180387E-03	0.338183E-03	0.296228E-03	0.311374E-03	0.393857E-03
0.534357E-03	0.451159E-03	0.180692E-02	0.266058E-02	0.277289E-02	0.433389E-02	0.449844E-02	0.294729E-02
0.430043E-02	0.327311E-02	0.261320E-02	0.233279E-02	0.233535E-02	0.258284E-02	0.285096E-02	0.309279E-02
0.323423E-02	0.383200E-02	0.666972E-02	0.968468E-02	0.240908E-02	0.219240E-02	0.197634E-02	0.192030E-02
0.660712E-03	-0.163309E-03	0.314199E-03	0.276388E-03	0.291128E-03	0.379168E-03	0.535621E-03	0.682476E-03
0.151175E-02	0.227050E-02	0.284953E-02	0.375003E-02	0.353356E-02	0.259937E-02	0.388710E-02	0.297959E-02
0.233685E-02	0.213504E-02	0.214682E-02	0.238866E-02	0.268220E-02	0.298863E-02	0.323173E-02	0.393427E-02
0.813365E-02	0.400076E-01	0.237167E-02	0.219190E-02	0.193597E-02	0.192399E-02	0.749296E-03	-0.106619E-03
0.282248E-03	0.249396E-03	0.269210E-03	0.362722E-03	0.534990E-03	0.723518E-03	0.123489E-02	0.181338E-02

8.2.3 Final Output (Blowing Method)

0.193331E-02	0.211927E-02	0.239048E-02	0.272091E-02	0.309011E-02	0.407872E-02	0.745158E-02	0.110509E-01

THE 120 X 120TRIANGULARIZED MATRIX WI[illegible] 1ADDITIONAL RIGHT SIDES WAS SOLVED DIF[illegible]TLY IN********MINUTES.

SOLUTIONS OBTAINED AFTER COLSOL

FLOW NO. 1

-0.550532E-02	-0.233624E-02	-0.122160E-02	-0.801516E-03	-0.807144E-03	-0.836659E-03	-0.728388E-03	-0.722896E-03
-0.745704E-03	-0.833537E-03	-0.863603E-03	-0.911771E-03	-0.725467E-03	-0.554025E-03	-0.476095E-03	0.482281E-03
0.109757E-02	0.152331E-02	0.135341E-02	0.118678E-02	0.106127E-02	0.982399E-03	0.956584E-03	0.997384E-03
0.107759E-02	0.115346E-02	0.124956E-02	0.169058E-02	0.310319E-02	0.643088E-02	-0.744041E-02	-0.331129E-02
-0.174501E-02	-0.111127E-02	-0.111049E-02	-0.107495E-02	-0.873325E-03	-0.812195E-03	-0.788152E-03	-0.798414E-03
-0.819203E-03	-0.833552E-03	-0.654232E-03	-0.511437E-03	-0.423757E-03	0.746382E-03	0.108974E-02	0.964488E-03
0.125892E-02	0.112986E-02	0.103669E-02	0.992311E-03	0.101657E-02	0.111869E-02	0.127136E-02	0.142551E-02
0.161473E-02	0.222738E-02	0.406217E-02	0.841862E-02	-0.821019E-02	-0.367147E-02	-0.193693E-02	-0.126537E-02
-0.114957E-02	-0.107376E-02	-0.348316E-03	-0.761933E-03	-0.714237E-03	-0.697447E-03	-0.693303E-03	-0.689248E-03
-0.556050E-03	-0.425644E-03	-0.273578E-03	0.618096E-03	0.863404E-03	0.813849E-03	0.109119E-02	0.985142E-03
0.920153E-03	0.933028E-03	0.951020E-03	0.107484E-02	0.125786E-02	0.145380E-02	0.171771E-02	0.242073E-02
0.442673E-02	0.919320E-02	-0.945656E-02	-0.419167E-02	-0.213571E-02	-0.130644E-02	-0.110802E-02	-0.100212E-02
-0.769671E-03	-0.665034E-03	-0.600954E-03	-0.558533E-03	-0.521373E-03	-0.434900E-03	-0.377636E-03	-0.284640E-03
-0.735871E-04	0.471776E-03	0.470825E-03	0.516672E-03	0.874742E-03	0.790779E-03	0.762535E-03	0.773491E-03
0.937033E-03	0.970333E-03	0.117253E-02	0.140879E-02	0.175209E-02	0.264171E-02	0.500980E-02	0.105345E-01

CHECKING THE SIGMAS AFTER 3. LAYER LINK.

SIGMAS OF THE UNIFORM FLOW NO. 1

0.512929E+00	0.2981J2E+00	0.202355E+00	0.152402E+00	0.126234E+00	0.112383E+00	0.106714E+00	0.107740E+00
0.111646E+00	0.1184J9E+00	0.123447E+00	0.126698E+00	0.127817E+00	0.126302E+00	0.127643E+00	-0.837184E-02
-0.7309695E-01	-0.8334823E-01	-0.979716E-01	-0.103157E+00	-0.105757E+00	-0.105205E+00	-0.106510E+00	-0.112840E+00
-0.1235J7E+00	-0.1401J8JE+00	-0.167488E+00	-0.216724E+00	-0.306988E+00	-0.526611E+00	0.602270E+00	0.345583E+00
0.232565E+00	0.1835J6E+00	0.148713E+00	0.130610E+00	0.121376E+00	0.119152E+00	0.119774E+00	0.123392E+00
0.1262J7E+00	0.1283J4E+00	0.129072E+00	0.127082E+00	0.127832E+00	-0.937512E-02	-0.743238E-01	-0.903834E-01
-0.999743E-01	-0.1J1163E+00	-0.110934E+00	-0.113690E+00	-0.118311E+00	-0.127857E+00	-0.142006E+00	-0.162763E+00
-0.195651E+00	-0.2538J0E+00	-0.359278E+00	-0.615868E+00	0.641330E+00	0.368358E+00	0.255468E+00	0.191914E+00
0.156491E+00	0.1332J2E+00	0.123105E+00	0.118152E+00	0.116111E+00	0.117052E+00	0.118117E+00	0.119629E+00
0.120141E+00	0.1186J4E+00	0.121416E+00	-0.462161E-02	-0.666324E-01	-0.820429E-01	-0.915066E-01	-0.983962E-01
-0.1049J3E+00	-0.1102J0E+00	-0.117473E+00	-0.129690E+00	-0.146722E+00	-0.170637E+00	-0.207070E+00	-0.269831E+00
-0.3821J6E+00	-0.65+J8JE+00	0.710495E+00	0.407370E+00	0.279284E+00	0.203791E+00	0.160462E+00	0.133903E+00
0.1173J6E+00	0.1037J4E+00	0.104504E+00	0.101910E+00	0.100172E+00	0.100412E+00	0.100893E+00	0.100497E+00
0.1038J5E+00	0.5J3J50E-02	-0.409257E-01	-0.639566E-01	-0.734565E-01	-0.815343E-01	-0.908780E-01	-0.997413E-01
-0.1099J6E+00	-0.125173E+00	-0.145811E+00	-0.174861E+00	-0.219119E+00	-0.293794E+00	-0.421273E+00	-0.724294E+00

SIGMAS OF THE NEW UNIFORM FLOW NO. 1

0.507424E+00	0.2J7L6E+00	0.201133E+00	0.151600E+00	0.125426E+00	0.111546E+00	0.105986E+00	0.107017E+00
0.110900E+00	0.117645E+00	0.122583E+00	0.125787E+00	0.127032E+00	0.125748E+00	0.127167E+00	-0.788955E-02
-0.719993E-01	-0.8732J4E-01	-0.966181E-01	-0.101971E+00	-0.104696E+00	-0.104222E+00	-0.105553E+00	-0.111843E+00
-0.122449E+00	-0.139J35E+00	-0.166238E+00	-0.215034E+00	-0.303785E+00	-0.520180E+00	0.594830E+00	0.342271E+00
0.237320E+00	0.1J7424E+00	0.147602E+00	0.129535E+00	0.120503E+00	0.118339E+00	0.118996E+00	0.122594E+00
0.125427E+00	0.1276J0E+00	0.128418E+00	0.126571E+00	0.127408E+00	-0.862823E-02	-0.732341E-01	-0.894188E-01
-0.987154E-01	-0.1J3J16E+00	-0.109898E+00	-0.112698E+00	-0.117294E+00	-0.125738E+00	-0.140735E+00	-0.161338E+00
-0.194036E+00	-0.2516J2E+00	-0.355215E+00	-0.607440E+00	0.633120E+00	0.364687E+00	0.253531E+00	0.190648E+00
0.155342E+00	0.13+1J1E+00	0.122257E+00	0.117390E+00	0.115397E+00	0.116355E+00	0.117423E+00	0.118940E+00
0.119535E+00	0.113219E+00	0.121142E+00	-0.400352E-02	-0.657690E-01	-0.812290E-01	-0.904993E-01	-0.974110E-01
-0.103983E+00	-0.1J3J37E+00	-0.116522E+00	-0.128615E+00	-0.145464E+00	-0.169178E+00	-0.205353E+00	-0.267411E+00
-0.377689E+00	-0.5+3737E+00	0.701038E+00	0.403179E+00	0.277149E+00	0.202484E+00	0.159354E+00	0.132901E+00
0.117147E+00	0.1J7J35E+00	0.103903E+00	0.101351E+00	0.996504E-01	0.999269E-01	0.100515E+00	0.100213E+00
0.107995E+00	0.653227E-02	-0.493549E-01	-0.634398E-01	-0.725817E-01	-0.807435E-01	-0.901154E-01	-0.989679E-01
-0.109149E+00	-0.12+202E+00	-0.144638E+00	-0.173452E+00	-0.217367E+00	-0.291152E+00	-0.416263E+00	-0.713759E+00

S-ARRAY

-0.68027E-02-0.77126E-02-0.75601E-02-0.71736E-02

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

FINAL OUTPUT FOR THE FOLLOWING ANGLE OF ATTACK

(0.989707, 0.0 , 0.143106)

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	1	58.584885 25.776428 -0.054459	0.919316 0.071722 0.075897	0.925228 0.856046 0.143954	0.993611 0.077518 0.082030	0.090204 -0.062060 -0.993988	0.067315 0.003035 12.052448
	2	57.372711 25.776474 -0.162476	0.941312 0.062533 0.076023	0.946445 0.895757 0.104243	0.994577 0.066071 0.080325	0.087012 -0.059807 -0.994410	0.068409 0.002568 12.238094
	3	55.494370 25.776413 -0.326453	0.960121 0.059697 0.078063	0.965137 0.931490 0.068510	0.994803 0.061854 0.080883	0.086719 -0.059595 -0.994449	0.068701 0.002073 25.419083
	4	52.906448 25.776428 -0.550439	0.979508 0.061003 0.078505	0.984541 0.969320 0.030680	0.994888 0.061961 0.079738	0.085462 -0.058637 -0.994615	0.068102 0.002052 26.528748
	5	50.203033 25.776443 -0.768573	0.994812 0.064954 0.071014	0.999457 0.998914 0.001086	0.995353 0.064990 0.071052	0.075367 -0.050544 -0.995874	0.068833 0.000973 27.697723
	6	47.375092 25.776443 -0.957004	1.006530 0.069511 0.055707	1.010463 1.021035 -0.021035	0.996108 0.068791 0.055130	0.057853 -0.035784 -0.997684	0.071791 0.000165 28.938980
	7	44.413589 25.776413 -1.088724	1.010314 0.077159 0.030495	1.013714 1.027617 -0.027617	0.996646 0.076115 0.030093	0.031566 -0.013516 -0.999423	0.077818 0.000448 30.266739
	8	41.309601 25.776459 -1.131930	0.998037 0.094557 -0.001435	1.002507 1.005021 -0.005021	0.995541 0.094320 -0.001431	-0.002927 0.013534 -0.999805	0.087651 0.000360 31.723709
	9	38.051025 25.776428 -1.073872	0.972721 0.116733 -0.025887	0.980042 0.960483 0.039517	0.992530 0.119110 -0.026415	-0.031933 0.047821 -0.998346	0.099668 0.000365 33.389236
	10	34.627487 25.776413 -0.902095	0.913200 0.160267 -0.048543	0.928426 0.861975 0.138025	0.983600 0.172622 -0.052285	-0.067104 0.083824 -0.994219	0.115419 0.000418 35.214935
	11	31.961624 25.776474 -0.680659	0.830988 0.231854 -0.063539	0.865064 0.748335 0.251665	0.960609 0.268020 -0.073450	-0.111306 0.131340 -0.985069	0.129360 0.000548 18.485550

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	12	30.585846	0.727929	0.805146	0.904096	-0.162682	0.138981
		25.776443	0.339289	0.648260	0.421400	0.187935	0.000670
		-0.499731	-0.057120	0.351740	-0.070943	-0.968615	9.554810
	13	29.886734	0.598476	0.768038	0.779227	-0.228777	0.144189
		25.776428	0.481161	0.589882	0.626480	0.261641	0.001993
		-0.364409	-0.013886	0.410118	-0.018079	-0.937659	5.013977
	14	29.510330	0.432023	0.803050	0.537978	-0.324309	0.144415
		25.776535	0.666581	0.644889	0.830062	0.368814	0.002980
		-0.254440	0.117961	0.355111	0.146891	-0.871091	3.232256
	15	29.274643	0.216528	1.268579	0.170685	-0.562733	0.139859
		25.776428	0.907098	1.609294	0.715050	0.637013	0.002921
		-0.100966	0.859990	-0.609294	0.677916	-0.526826	3.581857
	16	29.274643	1.193110	1.943120	0.614018	-0.562733	-0.025143
		25.776428	-0.199189	3.775715	-0.102510	0.637013	0.002855
		0.100966	1.520700	-2.775715	0.782607	0.526826	3.581857
	17	29.510330	1.479164	1.751359	0.844581	-0.324309	-0.093294
		25.776535	-0.524146	3.067260	-0.299280	0.368814	0.004310
		0.254440	0.777564	-2.067260	0.443977	0.871091	3.232257
	18	29.886734	1.402072	1.543750	0.908808	-0.228777	-0.106344
		25.776428	-0.438915	2.383164	-0.284317	0.261641	0.006178
		0.364409	0.471370	-1.383164	0.305341	0.937659	5.013977
	19	30.585846	1.323040	1.399626	0.945231	-0.162682	-0.111254
		25.776443	-0.348735	1.958951	-0.249206	0.187935	0.004684
		0.499731	0.294720	-0.958951	0.210570	0.968615	9.554810
	20	31.961624	1.254023	1.295312	0.968124	-0.111306	-0.109860
		25.776474	-0.269160	1.677834	-0.207795	0.131340	0.003515
		0.680659	0.181152	-0.677834	0.139852	0.985069	18.485550
	21	34.627487	1.199583	1.220465	0.982890	-0.067104	-0.103119
		25.776413	-0.200958	1.489533	-0.164657	0.083824	0.002830
		0.902095	0.100753	-0.489533	0.082553	0.994219	35.214935
	22	38.051025	1.150944	1.161224	0.991147	-0.031933	-0.092722
		25.776428	-0.147024	1.348441	-0.126611	0.047821	0.002573
		1.073872	0.046433	-0.348441	0.039996	0.998346	33.389236

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	23	41.309601 25.776459 1.131930	1.117623 -0.123398 0.008191	1.124444 1.264375 -0.264375	0.993934 -0.109741 0.007284	-0.002927 0.019534 0.999805	-0.085100 0.002508 31.723709
	24	44.413605 25.776428 1.088651	1.084700 -0.104570 -0.032968	1.090226 1.188594 -0.188594	0.994931 -0.095916 -0.030239	0.031615 -0.012546 0.999421	-0.082001 0.002656 30.266861
	25	47.375076 25.776428 0.956930	1.051818 -0.086279 -0.061189	1.057122 1.117507 -0.117507	0.994982 -0.081617 -0.057882	0.057801 -0.035725 0.997689	-0.080850 0.002831 28.938934
	26	50.203033 25.776443 0.768573	1.020360 -0.069197 -0.077741	1.025653 1.051965 -0.051965	0.994839 -0.067466 -0.075796	0.075367 -0.050544 0.995874	-0.080776 0.002979 27.697723
	27	52.906448 25.776428 0.550439	0.990742 -0.052055 -0.085225	0.995815 0.991647 0.008353	0.994906 -0.053278 -0.085583	0.085462 -0.038637 0.994615	-0.081443 0.003016 26.528748
	28	55.494370 25.776413 0.326453	0.966383 -0.039612 -0.083095	0.970757 0.942370 0.057630	0.995494 -0.040805 -0.085598	0.086719 -0.039595 0.994449	-0.081718 0.003530 25.419083
	29	57.372711 25.776474 0.162476	0.945888 -0.026516 -0.078341	0.949497 0.901544 0.098456	0.996199 -0.027926 -0.082508	0.087012 -0.059807 0.994410	-0.080823 0.005986 12.288094
	30	58.584885 25.776428 0.054459	0.921953 -0.009703 -0.075614	0.925039 0.855808 0.144192	0.996599 -0.010489 -0.081736	0.090204 -0.062060 0.993988	-0.079503 0.008606 12.052448

THE FORCE COMPONENTS OF THIS STRIP ARE -0.130913E+02 0.151837E+02 0.101575E+03

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.261118E+04 -0.355516E+04 0.810928E+03

2	1	52.210648 16.623062 -0.061845	0.926429 0.081919 0.076363	0.933173 0.870813 0.129187	0.992773 0.087785 0.081832	0.090204 -0.061962 -0.993994	0.077198 0.002587 11.506591

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	2	50.834076 16.623062 -0.184512	0.946475 0.069680 0.076279	0.952097 0.906488 0.093512	0.994095 0.073186 0.080116	0.087014 -0.059713 -0.994416	0.076515 0.002343 11.731304
	3	48.701050 16.623077 -0.370727	0.964918 0.058882 0.078556	0.969899 0.940704 0.059296	0.994864 0.060709 0.080994	0.086720 -0.059500 -0.994455	0.075291 0.002053 24.267700
	4	45.762115 16.623062 -0.625091	0.981951 0.048751 0.079562	0.986375 0.972935 0.027065	0.995515 0.049424 0.080661	0.085462 -0.058542 -0.994620	0.072741 0.001932 25.327362
	5	42.692001 16.623047 -0.872811	0.994091 0.041006 0.072511	0.997575 0.995157 0.004843	0.996507 0.041105 0.072687	0.075367 -0.050458 -0.995879	0.071597 0.000641 26.443405
	6	39.480560 16.623077 -1.086797	1.001659 0.035606 0.056994	1.003910 1.007836 -0.007836	0.997758 0.035467 0.056772	0.057854 -0.035710 -0.997686	0.072756 -0.000184 27.628036
	7	36.117416 16.623062 -1.236382	0.999946 0.037191 0.030783	1.001110 1.002221 -0.002221	0.998837 0.037150 0.030749	0.031566 -0.012456 -0.999424	0.076981 0.000336 28.896103
	8	32.592407 16.623062 -1.285449	0.981192 0.054235 -0.002104	0.982692 0.965683 0.034317	0.998474 0.055190 -0.002141	-0.002927 0.019580 -0.999804	0.084795 0.000293 30.286697
	9	28.831937 16.623062 -1.219516	0.950411 0.083717 -0.026695	0.954464 0.911002 0.088998	0.995753 0.087711 -0.027969	-0.031933 0.047858 -0.998344	0.094462 0.000309 31.877411
	10	25.004059 16.623062 -1.024441	0.894445 0.140279 -0.048931	0.906700 0.822105 0.177895	0.986484 0.154713 -0.053966	-0.067103 0.083854 -0.994216	0.107917 0.000391 33.620590
	11	21.976593 16.623077 -0.772973	0.822160 0.216141 -0.064613	0.852548 0.726838 0.273162	0.964356 0.253523 -0.075788	-0.111308 0.131372 -0.985065	0.120865 0.000530 17.648071
	12	20.414337 16.623093 -0.567506	0.727831 0.320035 -0.060805	0.797407 0.635858 0.364142	0.912747 0.401345 -0.076254	-0.162686 0.187972 -0.968607	0.130548 0.000646 9.121888

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

CN - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	13	19.620255 16.622971 -0.413832	0.605808 0.455543 -0.022315	0.758903 0.575933 0.424067	0.798269 0.601583 -0.029405	-0.228752 0.261651 -0.937663	0.136299 0.001799 4.787437
	14	19.192657 16.623016 -0.288950	0.447760 0.634228 0.098823	0.782624 0.612500 0.387500	0.572127 0.810387 0.126271	-0.324310 0.368867 -0.871068	0.137190 0.002652 3.085860
	15	18.925339 16.623154 -0.114660	0.234143 0.874352 0.802096	1.209410 1.462672 -0.462672	0.193601 0.722958 0.663213	-0.562718 0.637079 -0.526762	0.134912 0.002762 3.419737
	16	18.925339 16.623154 0.114660	1.163364 -0.177023 1.465081	1.879153 3.531216 -2.531216	0.619090 -0.094203 0.779650	-0.562718 0.637079 0.526762	-0.020327 0.004326 3.419737
	17	19.192657 16.623016 0.288950	1.452830 -0.505147 0.759990	1.715655 2.943472 -1.943472	0.846808 -0.294434 0.442973	-0.324310 0.368867 0.871068	-0.086341 0.004503 3.085860
	18	19.620255 16.622971 0.413832	1.383932 -0.427975 0.460195	1.519937 2.310208 -1.310208	0.910520 -0.281574 0.302773	-0.228752 0.261651 0.937663	-0.098897 0.002951 4.787437
	19	20.414337 16.623093 0.567506	1.309469 -0.344243 0.291190	1.384920 1.918003 -0.918003	0.945520 -0.248566 0.210258	-0.162686 0.187972 0.968607	-0.102755 0.004308 9.121888
	20	21.976593 16.623077 0.772973	1.247726 -0.274061 0.180868	1.290211 1.664643 -0.664643	0.967072 -0.212416 0.140185	-0.111308 0.131372 0.985065	-0.101187 0.003291 17.648071
	21	25.004059 16.623062 1.024441	1.200483 -0.218393 0.102078	1.224449 1.499275 -0.499275	0.980427 -0.178360 0.083367	-0.067103 0.083854 0.994216	-0.095440 0.002619 33.620605
	22	28.891937 16.623062 1.219516	1.163977 -0.178570 0.049132	1.178577 1.389045 -0.389045	0.987612 -0.151513 0.040839	-0.031933 0.047858 0.998344	-0.087858 0.002339 31.877411
	23	32.592407 16.623062 1.235449	1.140401 -0.156978 0.008754	1.151187 1.325232 -0.325232	0.990630 -0.136362 0.007605	-0.002926 0.019580 0.999804	-0.083101 0.002342 30.286697

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	24	36.117416 16.623062 1.236382	1.111311 -0.133587 -0.034178	1.119832 1.254024 -0.254024	0.992391 -0.119292 -0.030521	0.031566 -0.012455 0.999424	-0.082333 0.002585 28.896103
	25	39.480560 16.623077 1.086797	1.078040 -0.108534 -0.063539	1.085351 1.177986 -0.177986	0.993264 -0.099999 -0.058543	0.057854 -0.035710 0.997686	-0.083015 0.002852 27.628036
	26	42.692001 16.623047 0.872811	1.044102 -0.084278 -0.080183	1.050561 1.103679 -0.103679	0.993852 -0.080222 -0.076324	0.075367 -0.050458 0.995879	-0.084464 0.003091 26.443405
	27	45.762115 16.623062 0.625091	1.010642 -0.061231 -0.087197	1.016242 1.032748 -0.032748	0.994489 -0.060253 -0.085803	0.085462 -0.058542 0.994620	-0.086623 0.003228 25.327362
	28	48.701050 16.623077 0.370727	0.981820 -0.042191 -0.084227	0.986328 0.972844 0.027156	0.995429 -0.042776 -0.085394	0.086720 -0.059500 0.994455	-0.088512 0.003894 24.267700
	29	50.834076 16.623062 0.184512	0.957884 -0.026553 -0.078687	0.961478 0.924439 0.075561	0.996263 -0.027617 -0.081840	0.087014 -0.059713 0.994416	-0.088955 0.006687 11.731304
	30	52.210648 16.623062 0.061845	0.929946 -0.007883 -0.075173	0.933012 0.870512 0.129488	0.996713 -0.008449 -0.080571	0.090204 -0.061962 0.993994	-0.089330 0.009652 11.506591
		**********		**********		**********	

THE FORCE COMPONENTS OF THIS STRIP ARE -0.108191E+02 0.128092E+02 0.111453E+03

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.184495E+04 -0.298619E+04 0.445040E+03

		**********		**********		**********	
3	1	46.944550 9.054117 -0.067963	0.931067 0.076522 0.077322	0.937401 0.878721 0.121279	0.993243 0.081632 0.082486	0.090205 -0.061949 -0.993995	0.075915 0.002388 10.241095
	2	45.431732 9.054082 -0.202767	0.948769 0.062727 0.077041	0.953956 0.910032 0.089968	0.994562 0.065754 0.080760	0.087011 -0.059699 -0.994417	0.073466 0.002198 10.441466

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	3	43.087692	0.966181	0.970611	0.995436	0.086721	0.070896
		9.054122	0.047674	0.942085	0.049117	-0.059489	0.001982
		-0.407406	0.079411	0.057915	0.081815	-0.994456	21.598480
	4	39.858017	0.981543	0.985395	0.996091	0.085462	0.066977
		9.054117	0.033194	0.971004	0.033686	-0.058531	0.001911
		-0.636936	0.080464	0.028996	0.081656	-0.994621	22.541809
	5	36.484177	0.992431	0.995391	0.997026	0.075366	0.064631
		9.054108	0.022591	0.990802	0.022695	-0.050445	0.000655
		-0.959164	0.073303	0.009198	0.073643	-0.995879	23.535599
	6	32.954941	0.998839	1.000621	0.998219	0.057854	0.064608
		9.054112	0.015942	1.001242	0.015932	-0.035700	-0.000172
		-1.194322	0.057523	-0.001242	0.057487	-0.997687	24.589462
	7	29.259109	0.996347	0.996976	0.999369	0.031566	0.067573
		9.054119	0.017224	0.993961	0.017277	-0.012444	0.000311
		-1.358706	0.030944	0.006039	0.031038	-0.999424	25.713033
	8	25.385345	0.977827	0.978413	0.999402	-0.002927	0.073903
		9.054112	0.033754	0.957291	0.034498	0.019593	0.000272
		-1.412629	-0.002473	0.042709	-0.002528	-0.999804	26.956055
	9	21.318771	0.948051	0.950494	0.997431	-0.031933	0.081754
		9.054121	0.062236	0.903438	0.065478	0.047874	0.000288
		-1.340171	-0.027628	0.096562	-0.029067	-0.998343	28.371597
	10	17.046234	0.896595	0.905498	0.990168	-0.067103	0.093064
		9.054118	0.115991	0.819926	0.127986	0.083875	0.000376
		-1.125796	-0.051115	0.180074	-0.056450	-0.994214	29.923050
	11	13.719223	0.833885	0.857274	0.972717	-0.111308	0.104529
		9.054111	0.186186	0.734919	0.217184	0.131399	0.000529
		-0.849448	-0.069927	0.265081	-0.081569	-0.985061	15.707233
	12	12.002323	0.752273	0.805459	0.933968	-0.162684	0.113659
		9.054082	0.278423	0.648764	0.345670	0.189008	0.000678
		-0.623654	-0.073008	0.351236	-0.090641	-0.968601	8.118799
	13	11.129966	0.645170	0.760336	0.848532	-0.228748	0.119573
		9.054173	0.399514	0.578111	0.525444	0.261698	0.001507
		-0.454774	-0.047498	0.421889	-0.062470	-0.937650	4.260993

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	14	10.659925 9.054097 -0.317537	0.503692 0.559587 0.046851	0.754346 0.569038 0.430962	0.667721 0.741817 0.062109	-0.324282 0.368903 -0.871064	0.121667 0.002284 2.746725
	15	10.365980 9.054114 -0.126004	0.288621 0.802892 0.657554	1.077179 1.160316 -0.160316	0.267942 0.745366 0.610441	-0.562690 0.637163 -0.526691	0.123988 0.002841 3.043807
	16	10.365980 9.054114 0.126004	1.098018 -0.111178 1.314709	1.716526 2.946461 -1.946461	0.639674 -0.064769 0.765912	-0.562690 0.637163 0.526691	-0.010193 0.003764 3.043809
	17	10.659924 9.054096 0.317537	1.382144 -0.431542 0.701442	1.608903 2.588570 -1.588570	0.859060 -0.268221 0.435975	-0.324282 0.368903 0.871064	-0.071089 0.003600 2.746725
	18	11.129966 9.054173 0.454774	1.323298 -0.369944 0.430080	1.444368 2.086200 -1.086200	0.919639 -0.256129 0.297763	-0.228749 0.261698 0.937650	-0.082438 0.002605 4.260993
	19	12.002323 9.054092 0.623654	1.268307 -0.300560 0.275382	1.332206 1.774773 -0.774773	0.952035 -0.225611 0.206712	-0.162684 0.189008 0.968601	-0.085901 0.003895 8.118799
	20	13.719223 9.054111 0.849448	1.219538 -0.242172 0.173140	1.255347 1.575896 -0.575896	0.971474 -0.192912 0.137922	-0.111308 0.131399 0.985061	-0.084736 0.002988 15.707233
	21	17.046234 9.054118 1.125796	1.184553 -0.196577 0.098948	1.204823 1.451598 -0.451598	0.983176 -0.163159 0.082127	-0.067103 0.083875 0.994214	-0.080522 0.002401 29.923050
	22	21.318771 9.054121 1.340171	1.160368 -0.165044 0.047175	1.172995 1.375917 -0.375917	0.989236 -0.140703 0.040218	-0.031933 0.047874 0.998343	-0.075294 0.002142 28.371597
	23	25.385345 9.054112 1.412827	1.144544 -0.148639 0.009416	1.154185 1.332143 -0.332143	0.991646 -0.128783 0.007291	-0.002926 0.019593 0.999804	-0.072489 0.002152 26.956055
	24	29.259109 9.054119 1.358706	1.120389 -0.130177 -0.034626	1.128953 1.274535 -0.274535	0.992857 -0.115307 -0.030671	0.031566 -0.012444 0.999424	-0.073318 0.002396 25.718033

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	25	32.954941	1.090409	1.097754	0.993309	0.057854	-0.075318
		9.054112	-0.109187	1.205065	-0.099464	-0.035700	0.002688
		1.194321	-0.064443	-0.205065	-0.058705	0.997687	24.589478
	26	36.484177	1.056993	1.063745	0.993652	0.075366	-0.077945
		9.054108	-0.087703	1.131554	-0.082448	-0.050445	0.002996
		0.959164	-0.081426	-0.131554	-0.076546	0.995879	23.535599
	27	39.858017	1.022157	1.028086	0.994233	0.085462	-0.081232
		9.054117	-0.065831	1.056960	-0.064033	-0.058531	0.003237
		0.686936	-0.088448	-0.056960	-0.086031	0.994621	22.541809
	28	43.087692	0.990615	0.995340	0.995252	0.086721	-0.084371
		9.054122	-0.046152	0.990702	-0.046368	-0.059489	0.003949
		0.407406	-0.085176	0.009298	-0.085575	0.994456	21.598480
	29	45.431732	0.964861	0.968567	0.996173	0.087011	-0.086069
		9.054082	-0.029626	0.938123	-0.030587	-0.059699	0.006861
		0.202767	-0.079304	0.061877	-0.081878	0.994417	10.441466
	30	46.944550	0.934151	0.937229	0.996716	0.090205	-0.088164
		9.054117	-0.009490	0.878398	-0.010125	-0.061949	0.010004
		0.067963	-0.075301	0.121602	-0.080344	0.993995	10.241095

THE FORCE COMPONENTS OF THIS STRIP ARE -0.691670E+01 0.838728E+01 0.966357E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.868231E+03 -0.193099E+04 0.165875E+03

4	1	42.605057	0.936358	0.941765	0.994259	0.090205	0.072403
		2.822108	0.062983	0.886921	0.066878	-0.062035	0.002370
		-0.072996	0.078659	0.113079	0.083523	-0.993990	9.222164
	2	40.980225	0.953731	0.959228	0.995306	0.087009	0.067749
		2.820111	0.049746	0.918202	0.051915	-0.059790	0.002184
		-0.217782	0.078263	0.081798	0.081674	-0.994412	9.402838
	3	38.462585	0.972828	0.976858	0.995874	0.086721	0.063519
		2.820112	0.036813	0.954252	0.037685	-0.059572	0.001978
		-0.437574	0.080642	0.045748	0.082552	-0.994451	19.449326

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	4	34.993744 2.820097 -0.737803	0.986878 0.027516 0.081248	0.990599 0.991287 0.018713	0.996244 0.027777 0.082019	0.085462 -0.058613 -0.994616	0.058002 0.001917 20.299210
	5	31.370087 2.820125 -1.030190	0.995647 0.021577 0.073505	0.998590 0.997182 0.002818	0.997053 0.021608 0.073609	0.075368 -0.050523 -0.995876	0.054339 0.000748 21.193649
	6	27.575529 2.820107 -1.282761	0.999253 0.018654 0.057385	1.001072 1.002146 -0.002146	0.998183 0.018634 0.057323	0.057853 -0.035769 -0.997684	0.053016 -0.000109 22.142944
	7	23.609985 2.820098 -1.459319	0.993576 0.021622 0.030833	0.994289 0.998611 0.011389	0.999282 0.021746 0.031010	0.031566 -0.012510 -0.999424	0.054502 0.000278 23.159302
	8	19.449387 2.820113 -1.517233	0.972364 0.035824 -0.002391	0.973027 0.946781 0.053219	0.999319 0.036817 -0.002458	-0.002927 0.019528 -0.999805	0.059951 0.000245 24.273834
	9	15.081688 2.820106 -1.439410	0.941344 0.056944 -0.027648	0.943470 0.890135 0.109865	0.997747 0.060355 -0.029305	-0.031933 0.047804 -0.998346	0.064372 0.000264 25.548492
	10	10.492810 2.820112 -1.209160	0.894415 0.096121 -0.052627	0.901103 0.811987 0.188013	0.992578 0.106670 -0.058403	-0.067104 0.083793 -0.994221	0.072449 0.000358 26.945343
	11	6.919413 2.820093 -0.912350	0.841295 0.149452 -0.075680	0.857912 0.735341 0.264159	0.980746 0.174225 -0.088224	-0.111307 0.131292 -0.985075	0.081188 0.000530 14.144451
	12	5.075452 2.820136 -0.669835	0.777130 0.220321 -0.088534	0.812595 0.660311 0.339689	0.956356 0.271132 -0.108952	-0.162689 0.187873 -0.968626	0.089024 0.000718 7.310763
	13	4.138274 2.820052 -0.438451	0.691420 0.315638 -0.082011	0.764470 0.534414 0.415586	0.904443 0.412884 -0.107279	-0.229757 0.261520 -0.937698	0.094963 0.001280 3.836887
	14	3.633697 2.820199 -0.341050	0.574279 0.447692 -0.026402	0.728643 0.530921 0.469079	0.788148 0.614418 -0.036234	-0.324336 0.368706 -0.871127	0.098478 0.001806 2.473024

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

CN - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	15	3.317806	0.359984	0.808196	0.400786	-0.562828	0.107291
		2.820056	0.691540	0.806757	0.769920	0.636981	0.002814
		-0.135334	0.446028	0.193243	0.496582	-0.526885	2.740273
	16	3.317806	0.993331	1.474307	0.673761	-0.562828	0.004120
		2.820056	-0.018280	2.173582	-0.012399	0.636881	0.003211
		0.135334	1.089285	-1.173582	0.738845	0.526885	2.740273
	17	3.633697	1.269545	1.446096	0.877911	-0.324336	-0.049306
		2.820199	-0.323857	2.091195	-0.223953	0.368706	0.001981
		0.341050	0.612021	-1.091195	0.423223	0.871127	2.473024
	18	4.138274	1.239125	1.327600	0.933357	-0.228757	-0.058972
		2.820052	-0.293393	1.762524	-0.213463	0.261520	0.001681
		0.488451	0.383121	-0.762524	0.288582	0.937698	3.836887
	19	5.075466	1.201921	1.249610	0.961837	-0.162695	-0.062323
		2.820173	-0.232603	1.561525	-0.186140	0.187881	0.003503
		0.669835	0.250615	-0.561525	0.200554	0.963623	7.310487
	20	6.919363	1.174138	1.200015	0.978436	-0.111305	-0.062613
		2.820075	-0.188839	1.440037	-0.157364	0.131290	0.002675
		0.912350	0.160552	-0.440037	0.133792	0.985076	14.144726
	21	10.492810	1.157698	1.171226	0.988450	-0.067104	-0.061549
		2.820112	-0.151148	1.371769	-0.129051	0.083793	0.002175
		1.209161	0.093063	-0.371769	0.079458	0.994222	26.945343
	22	15.081688	1.148385	1.156156	0.993364	-0.031933	-0.059778
		2.820106	-0.125232	1.336466	-0.108327	0.047804	0.001946
		1.439410	0.044678	-0.336466	0.038647	0.998346	25.548492
	23	19.449387	1.142737	1.148287	0.995167	-0.002927	-0.059387
		2.820113	-0.112511	1.318562	-0.097982	0.019528	0.001936
		1.517232	0.007479	-0.318562	0.006513	0.999805	24.273834
	24	23.609935	1.128059	1.133059	0.995588	0.031566	-0.061838
		2.820098	-0.100480	1.283821	-0.088680	-0.012510	0.002124
		1.459319	-0.034762	-0.283821	-0.030680	0.999424	23.159317
	25	27.579529	1.104014	1.109374	0.995169	0.057854	-0.064984
		2.820107	-0.087579	1.230710	-0.078944	-0.035769	0.002393
		1.282760	-0.064761	-0.230710	-0.058376	0.997684	22.142944

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	26	31.370087 2.820125 1.030189	1.074295 -0.075070 -0.082376	1.080060 1.166530 -0.166530	0.994662 -0.069506 -0.076270	0.075367 -0.050523 0.995876	-0.068573 0.002723 21.193649
	27	34.993744 2.820097 0.737803	1.040253 -0.062236 -0.089942	1.045986 1.094087 -0.094087	0.994519 -0.059500 -0.085988	0.085462 -0.058613 0.994616	-0.072867 0.003092 20.299210
	28	38.462585 2.820112 0.437574	1.005703 -0.050335 -0.086611	1.010677 1.021469 -0.021469	0.995078 -0.049773 -0.085696	0.086721 -0.059572 0.994451	-0.077332 0.004082 19.449326
	29	40.980225 2.820111 0.217782	0.974965 -0.037743 -0.080075	0.978976 0.958393 0.041607	0.995903 -0.038554 -0.081795	0.087009 -0.059780 0.994412	-0.080529 0.007459 9.402838
	30	42.605057 2.820109 0.072996	0.938443 -0.016455 -0.075064	0.941584 0.886581 0.113419	0.996664 -0.017476 -0.079721	0.090205 -0.062035 0.993990	-0.084757 0.011059 9.222164

THE FORCE COMPONENTS OF THIS STRIP ARE -0.283281E+01 0.377376E+01 0.805770E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.221930E+03 -0.120236E+04 0.258051E+02

THE FORCE COMPONENTS OF THE SECTION ARE -0.336599E+02 0.401539E+02 0.390241E+03

THE MOMENT COMPONENTS OF THE SECTION ARE 0.554629E+04 -0.967470E+04 0.144765E+04

THE FORCE COMPONENTS OF THE ENTIRE BODY ARE -0.336599E+02 0.401539E+02 0.390241E+03

THE MOMENT COMPONENTS OF THE ENTIRE BODY ARE 0.554629E+04 -0.967470E+04 0.144765E+04

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. BLOWING. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

STRIP NO.	B (STRIP)
1	-0.680271E-02
2	-0.771260E-02
3	-0.756008E-02
4	-0.717356E-02

********** ********** **********

TOTAL RUN TIME FOR THIS CASE WAS 0.58883 MINUTES.

8.2.4 Final Output (Displacement Method)

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

K	KI	DEL STAR							
1	1	0.00245	0.00210	0.00170	0.00121	0.00072	0.00076	0.00062	0.00054
		0.00045	0.00036	0.00027	0.00020	0.00016	0.00004	0.00003	0.00005
		0.00009	0.00024	0.00048	0.00086	0.00145	0.00218	0.00284	0.00354
		0.00429	0.00509	0.00594	0.00676	0.00757	0.00860	0.00860	
2	2	0.00237	0.00202	0.00159	0.00108	0.00056	0.00075	0.00064	0.00057
		0.00049	0.00040	0.00029	0.00021	0.00016	0.00004	0.00003	0.00005
		0.00015	0.00022	0.00047	0.00086	0.00148	0.00221	0.00286	0.00357
		0.00439	0.00529	0.00628	0.00728	0.00828	0.00957	0.00957	
3	3	0.00250	0.00215	0.00170	0.00115	0.00059	0.00078	0.00068	0.00060
		0.00052	0.00042	0.00031	0.00022	0.00016	0.00006	0.00003	0.00005
		0.00015	0.00021	0.00046	0.00086	0.00148	0.00223	0.00283	0.00354
		0.00435	0.00527	0.00631	0.00742	0.00851	0.00997	0.00997	
4	4	0.00258	0.00231	0.00182	0.00124	0.00063	0.00079	0.00069	0.00062
		0.00054	0.00045	0.00032	0.00023	0.00016	0.00007	0.00001	0.00006
		0.00013	0.00015	0.00040	0.00079	0.00140	0.00208	0.00269	0.00333
		0.00407	0.00492	0.00592	0.00706	0.00829	0.01000	0.01000	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

---------- * ----------

BEGIN THE SUBROUTINE DINPUT . TIME IS 34.585 SEC.

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
1	1	62.713120 30.897595 -0.035126	61.603180 30.898285 -0.127787	54.545517 20.898381 -0.143409	55.833115 20.898010 -0.035249	0.083317 -0.057279 -0.994876	58.587616 25.774582 -0.085490	1.5365E-04 1.2912E+01 1.2052E+01	LIFT
	2	61.603180 30.898285 -0.127787	60.471329 30.898590 -0.222275	53.232559 20.898621 -0.253697	54.545517 20.898331 -0.143409	0.083317 -0.057217 -0.994879	57.374847 25.774933 -0.187082	1.5767E-04 1.3041E+01 1.2289E+01	
	3	60.471329 30.898590 -0.222275	58.130447 30.898911 -0.421110	50.516891 20.898972 -0.485036	53.232559 20.898621 -0.253697	0.084616 -0.058095 -0.994719	55.496048 25.775223 -0.346118	1.5494E-04 1.4112E+01 2.5419E+01	
	4	58.130447 30.898911 -0.421110	55.686905 30.899323 -0.625217	47.682129 20.899353 -0.722579	50.516891 20.898972 -0.485036	0.083237 -0.056978 -0.994900	52.907593 25.775574 -0.564482	1.7551E-04 1.4465E+01 2.6530E+01	
	5	55.686905 30.899323 -0.625217	53.132629 30.899567 -0.815781	44.718979 20.899612 -0.944473	47.682129 20.899353 -0.722579	0.074450 -0.049861 -0.995977	50.203735 25.775925 -0.778408	1.9079E-04 1.4846E+01 2.7700E+01	
	6	53.132629 30.899567 -0.815781	50.459213 30.899734 -0.970221	41.617630 20.899750 -1.124274	44.718979 20.899612 -0.944473	-0.057744 -0.035715 -0.997693	47.375519 25.776123 -0.965432	1.4819E-04 1.5254E+01 2.8942E+01	
	7	50.459213 30.899734 -0.970221	47.658249 30.899963 -1.057371	38.368149 20.899979 -1.225708	41.617630 20.899750 -1.124274	0.031150 -0.012130 -0.999441	44.413788 25.776291 -1.096384	7.6175E-05 1.5692E+01 3.0271E+01	
	8	47.658249 30.899963 -1.057371	44.721359 30.900146 -1.047718	34.961151 20.900162 -1.214739	38.368149 20.899979 -1.225708	-0.003249 0.019859 -0.999798	41.309555 25.776535 -1.133454	5.3465E-05 1.6163E+01 3.1728E+01	
	9	44.721359 30.900146 -1.047718	41.634903 30.900253 -0.947925	31.380493 20.900299 -1.099159	34.961151 20.900162 -1.214739	-0.032248 0.048158 -0.998319	38.050827 25.776657 -1.079350	4.5354E-05 1.6673E+01 3.3393E+01	
	10	41.634903 30.900253 -0.947925	38.393234 30.900345 -0.728033	27.619690 20.900360 -0.844180	31.380493 20.900299 -1.099159	-0.067417 0.084173 -0.994168	34.627167 25.776749 -0.906475	2.9450E-05 1.7217E+01 3.5219E+01	
	11	38.393234 30.900345 -0.728033	36.707153 30.900375 -0.536539	25.663757 20.900391 -0.622119	27.619690 20.900360 -0.844180	-0.111837 0.131932 -0.984930	31.961243 25.776886 -0.683963	1.9287E-05 1.6138E+01 1.8489E+01	
	12	36.707153 30.900375	35.850220 30.900421	24.669617 20.900436	25.663757 20.900391	-0.163382 0.188720	30.585403 25.776871	1.8233E-05 1.5650E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
1	13	35.850220 30.900421 -0.391912	35.415070 30.900284 -0.284756	24.164749 20.900299 -0.330201	24.669617 20.900436 -0.454412	-0.230611 0.263697 -0.936634	29.886307 25.776764 -0.365988	2.5962E-05 1.5380E+01 5.0164E+00	LIFT
	14	35.415070 30.900284 -0.284756	35.154465 30.900146 -0.186924	23.862457 20.900162 -0.216806	24.164749 20.900299 -0.330201	-0.326396 0.371161 -0.869313	29.510147 25.776855 -0.255135	1.7099E-05 1.5280E+01 3.2358E+00	
	15	35.154465 30.900146 -0.186924	34.979691 30.900238 0.000052	23.659698 20.900253 0.000055	23.862457 20.900162 -0.216806	-0.562865 0.637163 -0.526503	29.274490 25.776733 -0.101091	4.1658E-06 1.5237E+01 3.5873E+00	
	16	34.979691 30.900238 0.000052	35.154327 30.900330 0.187222	23.862259 20.900391 0.217266	23.659698 20.900253 0.000055	-0.563408 0.637782 0.525172	29.274185 25.776642 0.101335	1.8060E-05 1.5237E+01 3.5887E+00	
	17	35.154327 30.900330 0.187222	35.414841 30.900513 0.285474	24.164490 20.900574 0.331000	23.862259 20.900391 0.217266	-0.327376 0.372276 0.868467	29.509979 25.777130 0.255706	5.7042E-05 1.5280E+01 3.2377E+00	
	18	35.414841 30.900513 0.285474	35.849854 30.900879 0.394010	24.669266 20.900848 0.456358	24.164490 20.900574 0.331000	-0.232958 0.266318 0.935310	29.886078 25.777176 0.367376	1.3764E-04 1.5380E+01 5.0201E+00	
	19	35.849854 30.900879 0.394010	36.706482 30.901169 0.541669	25.663101 20.901169 0.627119	24.669266 20.900848 0.456358	-0.166486 0.192145 0.967141	30.584930 25.777496 0.505702	1.2253E-04 1.5650E+01 9.5631E+00	
	20	36.706482 30.901169 0.541669	38.392410 30.901382 0.738011	27.618896 20.901367 0.854086	25.663101 20.901169 0.627119	-0.114424 0.134737 0.984253	31.960510 25.777786 0.691465	1.8445E-04 1.6188E+01 1.8493E+01	
	21	38.392410 30.901382 0.738011	41.634155 30.901306 0.964786	31.379745 20.901306 1.115956	27.618896 20.901367 0.854086	-0.069351 0.086195 0.993862	34.626389 25.777802 0.919860	2.7966E-04 1.7217E+01 3.5230E+01	
	22	41.634155 30.901306 0.964786	44.720993 30.900925 1.071942	34.960785 20.900909 1.238858	31.379745 20.901306 1.115956	-0.034432 0.050332 0.998139	38.050308 25.777588 1.099849	3.2482E-04 1.6673E+01 3.3405E+01	
	23	44.720993 30.900925 1.071942	47.658783 30.900009 1.089663	38.368668 20.900024 1.257063	34.960785 20.900909 1.238858	-0.005493 0.021992 0.999743	41.309692 25.776978 1.166196	2.7993E-04 1.6163E+01 3.1745E+01	
	24	47.658783 30.900009	50.460999 30.898773	41.619415 20.898758	38.368668 20.900024	0.028694 -0.009873	44.414978 25.775879	2.2787E-04 1.5693E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
1	25	50.460999 30.898773 1.008662	53.135834 30.897491 0.863045	44.722321 20.897461 0.993190	41.619415 20.898758 1.163253	0.054512 -0.032823 0.997974	47.378067 25.774612 1.008795	2.6485E-04 1.5254E+01 2.8958E+01	LIFT
	26	53.135834 30.897491 0.863045	55.691299 30.896317 0.679553	47.686722 20.896225 0.779422	44.722321 20.897461 0.993190	0.071682 -0.047386 0.996301	50.207642 25.773346 0.830222	2.1110E-04 1.4846E+01 2.7712E+01	
	27	55.691299 30.896317 0.679553	58.135529 30.895432 0.479536	50.522232 20.895309 0.546760	47.686722 20.896225 0.779422	0.081533 -0.055354 0.995133	52.912460 25.772263 0.622349	1.4529E-04 1.4466E+01 2.6535E+01	
	28	58.135529 30.895432 0.479536	60.476807 30.894836 0.285180	53.238434 20.894623 0.320810	50.522232 20.895309 0.546760	0.082674 -0.056275 0.994987	55.501465 25.771469 0.408707	1.0787E-04 1.4112E+01 2.5420E+01	
	29	60.476807 30.894836 0.285180	61.609360 30.894028 0.197122	54.552200 20.893753 0.218256	53.238434 20.894623 0.320810	0.077540 -0.052597 0.995601	57.380905 25.770813 0.255693	9.3849E-05 1.3041E+01 1.2292E+01	
	30	61.609360 30.894028 0.197122	62.719986 30.893250 0.110766	55.840622 20.892883 0.117679	54.552200 20.893753 0.218256	0.077540 -0.052634 0.995599	58.594437 25.769928 0.161129	9.1846E-05 1.2912E+01 1.2054E+01	
	31	62.719986 30.893250 0.110766	63.829163 30.893250 0.110766	57.127396 20.892883 0.117679	55.840622 20.892883 0.117679	0.0 0.000691 1.000000	59.795380 25.769516 0.114308	5.5879E-09 1.2799E+01 1.1980E+01	WAKE
2	1	55.833115 20.898310 -0.035249	54.545517 20.898331 -0.143409	48.625946 12.498333 -0.157278	50.063187 12.498013 -0.036146	0.083700 -0.057365 -0.994838	52.213409 16.621246 -0.093088	9.4905E-05 1.1069E+01 1.1506E+01	LIFT
	2	54.545517 20.898331 -0.143409	53.232559 20.898621 -0.253697	47.160385 12.498642 -0.280793	48.625946 12.498333 -0.157278	0.083701 -0.057319 -0.994841	50.836182 16.621552 -0.208981	9.7364E-05 1.1185E+01 1.1732E+01	
	3	53.232559 20.898621 -0.253697	50.516891 20.898972 -0.485036	44.129059 12.498997 -0.539310	47.160385 12.498642 -0.280793	0.084779 -0.058060 -0.994707	48.702682 16.621887 -0.390081	6.8754E-05 1.2390E+01 2.4268E+01	
	4	50.516891 20.898972 -0.485036	47.682129 20.899353 -0.722579	40.964767 12.499409 -0.804792	44.129059 12.498997 -0.539310	0.083408 -0.056984 -0.994885	45.763214 16.622269 -0.638545	6.8977E-05 1.2724E+01 2.5328E+01	
	5	47.682129 20.899353	44.713979 20.899612	37.657158 12.499638	40.964767 12.499409	0.074665 -0.049934	42.692657 16.622574	1.2982E-04 1.3083E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
2	6	44.718979 20.899612 -0.944473	41.617630 20.899750 -1.124274	34.195328 12.499763 -1.254255	37.657150 12.499638 -1.052994	0.057924 -0.035776 -0.997680	39.480942 16.622772 -1.095089	1.3380E-04 1.3469E+01 2.7630E+01	LIFT
	7	41.617630 20.899750 -1.124274	38.368149 20.899979 -1.225708	30.568176 12.499992 -1.367726	34.195328 12.499763 -1.254255	0.031233 -0.012119 -0.999439	36.117630 16.622955 -1.244234	5.9232E-05 1.3882E+01 2.8900E+01	
	8	38.368149 20.899979 -1.225708	34.961151 20.900162 -1.214739	26.765030 12.500187 -1.355647	30.568176 12.499992 -1.367726	-0.003195 0.019880 -0.999797	32.592377 16.623138 -1.292250	3.9607E-05 1.4325E+01 3.0290E+01	
	9	34.961151 20.900162 -1.214739	31.380493 20.900299 -1.099159	22.768066 12.500324 -1.226755	26.765030 12.500187 -1.355647	-0.032206 0.048179 -0.998320	28.891708 16.623322 -1.225304	2.9638E-05 1.4806E+01 3.1881E+01	
	10	31.380493 20.900299 -1.099159	27.619690 20.900360 -0.844180	18.570053 12.500416 -0.942173	22.768066 12.500324 -1.226755	-0.067397 0.084206 -0.994167	25.003708 16.623428 -1.029099	9.1195E-06 1.5320E+01 3.3624E+01	
	11	27.619690 20.900360 -0.844180	25.663757 20.900391 -0.622119	16.386749 12.500462 -0.694284	18.570053 12.500416 -0.942173	-0.111822 0.131960 -0.984927	21.976151 16.623489 -0.776467	2.3693E-06 1.4027E+01 1.7651E+01	
	12	25.663757 20.900391 -0.622119	24.669617 20.900436 -0.454412	15.277130 12.500473 -0.507070	16.386749 12.500462 -0.694284	-0.163363 0.188738 -0.968344	20.413879 16.623550 -0.570042	5.8115E-06 1.3359E+01 9.1248E+00	
	13	24.669617 20.900436 -0.454412	24.164749 20.900299 -0.330201	14.713440 12.500336 -0.368533	15.277130 12.500473 -0.507070	-0.230398 0.263502 -0.936741	19.619843 16.623367 -0.415471	3.2231E-05 1.3027E+01 4.7897E+00	
	14	24.164749 20.900299 -0.330201	23.862457 20.900162 -0.216806	14.375965 12.500198 -0.242033	14.713440 12.500336 -0.368533	-0.326193 0.370993 -0.869461	19.192398 16.623306 -0.289685	2.0142E-05 1.2899E+01 3.0883E+00	
	15	23.862457 20.900162 -0.216806	23.659698 20.900253 0.000055	14.149670 12.500290 0.000067	14.375965 12.500198 -0.242033	-0.562849 0.637232 -0.526437	18.925003 16.623337 -0.114794	1.3903E-05 1.2843E+01 3.4248E+00	
	16	23.659698 20.900253 0.000055	23.862259 20.900391 0.217266	14.375702 12.500507 0.242619	14.149670 12.500290 0.000067	-0.563509 0.637986 0.524816	18.924820 16.623413 0.115117	3.3617E-05 1.2843E+01 3.4267E+00	
	17	23.862259 20.900391	24.164490 20.900574	14.713171 12.500645	14.375702 12.500507	-0.326816 0.371704	19.192154 16.623566	2.7578E-05 1.2899E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
2	18	24.164490 20.900574 0.331000	24.669266 20.900848 0.456358	15.276810 12.500899 0.508818	14.713177 12.500645 0.369347	-0.232071 0.265362 0.935803	19.619568 16.623718 0.416796	1.1761E-04 1.3027E+01 4.7928E+00	LIFT
	19	24.669266 20.900848 0.456358	25.663101 20.901169 0.627119	16.386124 12.501183 0.699075	15.276810 12.500839 0.508818	-0.166101 0.191747 0.967287	20.413422 16.624146 0.573411	7.9662E-05 1.3359E+01 9.1287E+00	
	20	25.663101 20.901169 0.627119	27.618896 20.901367 0.854086	18.569275 12.501400 0.951887	16.386124 12.501183 0.699075	-0.114116 0.134432 0.984330	21.975449 16.624374 0.783817	1.2669E-04 1.4027E+01 1.7658E+01	
	21	27.618896 20.901367 0.854086	31.379745 20.901306 1.115956	22.767334 12.501343 1.243303	18.569275 12.501400 0.951887	-0.069093 0.085958 0.993910	25.002960 16.624435 1.042337	2.0957E-04 1.5320E+01 3.3633E+01	
	22	31.379745 20.901306 1.115956	34.960785 20.900909 1.238858	26.764664 12.500942 1.379380	22.767334 12.501343 1.243303	-0.034105 0.050038 0.998165	28.891174 16.624191 1.245600	2.6076E-04 1.4807E+01 3.1891E+01	
	23	34.960785 20.900909 1.238858	38.368668 20.900024 1.257042	30.568680 12.500050 1.398641	26.764664 12.500942 1.379380	-0.005185 0.021726 0.999751	32.592468 16.623566 1.319770	2.4386E-04 1.4325E+01 3.0305E+01	
	24	38.368668 20.900024 1.257042	41.619415 20.898758 1.163253	34.197144 12.498779 1.293174	30.568680 12.500050 1.398641	0.028948 -0.010075 0.999530	36.118790 16.622513 1.279269	1.8453E-04 1.3882E+01 2.8916E+01	
	25	41.619415 20.898758 1.163253	44.722321 20.897461 0.993190	37.660538 12.497440 1.102670	34.197144 12.498779 1.293174	0.054786 -0.033013 0.997952	39.483566 16.621216 1.139165	1.6136E-04 1.3469E+01 2.7645E+01	
	26	44.722321 20.897461 0.993190	47.686722 20.896225 0.779422	40.969574 12.496159 0.863799	37.660538 12.497440 1.102670	0.071864 -0.047445 0.996286	42.696686 16.619888 0.935657	5.9992E-05 1.3033E+01 2.6456E+01	
	27	47.686722 20.896225 0.779422	50.522232 20.895309 0.546760	44.134689 12.495140 0.604267	40.969574 12.496159 0.863799	0.081606 -0.055251 0.995132	45.768295 16.618790 0.699211	4.2200E-05 1.2724E+01 2.5333E+01	
	28	50.522232 20.895309 0.546760	53.234434 20.894623 0.320910	47.166641 12.494350 0.352492	44.134689 12.495140 0.604267	0.082680 -0.056034 0.995000	48.708466 16.617935 0.456489	1.0344E-04 1.2390E+01 2.4259E+01	
	29	53.234434 20.894623	54.552200 20.893753	48.633199 12.493332	47.166641 12.494350	0.077430 -0.052172	50.842712 16.617096	1.6845E-04 1.1185E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
2	30	54.552200 20.893753 0.218256	55.840622 20.892883 0.117679	50.071442 12.492336 0.127146	48.633194 12.493332 0.238720	0.077430 -0.052093 0.995636	52.220856 16.616165 0.175587	1.6469E-04 1.1069E+01 1.1508E+01	LIFT
	31	55.840622 20.892883 0.117679	57.127396 20.892883 0.117679	51.507843 12.492336 0.127146	50.071442 12.492336 0.127146	0.0 0.001127 1.000000	53.584671 16.615677 0.122500	2.7940E-09 1.0971E+01 1.1438E+01	WAKE
3	1	50.063187 12.498013 -0.036146	48.625946 12.498333 -0.157278	43.834900 5.698239 -0.170080	45.393417 5.697910 -0.038600	0.083874 -0.057230 -0.994832	46.947418 9.052237 -0.100577	3.0980E-05 9.2221E+00 1.0240E+01	LIFT
	2	48.625946 12.498333 -0.157278	47.160385 12.498642 -0.280793	42.245636 5.698571 -0.304154	43.834900 5.698239 -0.170080	0.083875 -0.057212 -0.994833	45.433929 9.052535 -0.228198	3.1650E-05 9.3256E+00 1.0442E+01	
	3	47.160385 12.498642 -0.280793	44.129059 12.498997 -0.539310	38.958572 5.698950 -0.584584	42.245636 5.698571 -0.304154	0.084840 -0.057894 -0.994712	43.089371 9.052909 -0.427442	2.4498E-05 1.0658E+01 2.1599E+01	
	4	44.129059 12.498997 -0.539310	40.964767 12.499409 -0.804759	35.527313 5.699393 -0.872515	38.958572 5.698950 -0.584584	0.083466 -0.056834 -0.994889	39.859131 9.053311 -0.700673	2.1368E-05 1.0970E+01 2.2542E+01	
	5	40.964767 12.499409 -0.804759	37.657150 12.499638 -1.052994	31.940598 5.699644 -1.141529	35.527313 5.699393 -0.872515	0.074718 -0.049834 -0.995959	36.484818 9.053637 -0.968476	4.0457E-05 1.1304E+01 2.3537E+01	
	6	37.657150 12.499638 -1.052994	34.195328 12.499763 -1.254255	28.186661 5.699777 -1.359658	31.940598 5.699644 -1.141529	0.057985 -0.035765 -0.997677	32.955368 9.053822 -1.202763	2.6822E-05 1.1663E+01 2.4591E+01	
	7	34.195328 12.499763 -1.254255	30.568176 12.499992 -1.367726	24.253464 5.700019 -1.482820	28.186661 5.699777 -1.359658	0.031281 -0.012141 -0.999437	29.259323 9.054005 -1.366853	2.7850E-05 1.2047E+01 2.5721E+01	
	8	30.568176 12.499992 -1.367726	26.765030 12.500187 -1.355647	20.129425 5.700222 -1.469813	24.253464 5.700019 -1.482820	-0.003163 0.019866 -0.999798	25.385330 9.054224 -1.419774	2.2575E-05 1.2459E+01 2.6959E+01	
	9	26.765030 12.500187 -1.355647	22.768066 12.500324 -1.226755	15.795284 5.700369 -1.330122	20.129425 5.700222 -1.469813	-0.032183 0.048172 -0.998321	21.318527 9.054403 -1.346317	1.7834E-05 1.2906E+01 2.8374E+01	
	10	22.768066 12.500324	18.570053 12.500416	11.243095 5.700465	15.795284 5.700369	-0.067389 0.084217	17.045683 9.054520	9.0913E-06 1.3383E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
3	11	18.570053 12.500416 -0.942173	16.386749 12.500462 -0.694284	8.875557 5.700500 -0.752752	11.243099 5.700465 -1.021563	-0.111825 0.131990 -0.984923	13.718788 9.054577 -0.853157	2.5034E-06 1.1843E+01 1.5710E+01	LIFT
	12	16.386749 12.500462 -0.694284	15.277130 12.500473 -0.507070	7.672251 5.700502 -0.549697	8.875557 5.700500 -0.752752	-0.163388 0.188802 -0.968328	12.001877 9.054564 -0.626292	7.3314E-06 1.1055E+01 8.1211E+00	
	13	15.277130 12.500473 -0.507070	14.713440 12.500336 -0.368533	7.061039 5.700397 -0.399609	7.672251 5.700502 -0.549697	-0.230200 0.263331 -0.936838	11.129565 9.054607 -0.456475	3.2276E-05 1.0666E+01 4.2629E+00	
	14	14.713440 12.500336 -0.368533	14.375965 12.500198 -0.242033	6.695097 5.700222 -0.262470	7.061039 5.700397 -0.399609	-0.326067 0.370919 -0.869540	10.659674 9.054425 -0.318335	3.0175E-06 1.0514E+01 2.7490E+00	
	15	14.375965 12.500198 -0.242033	14.149670 12.500290 0.000067	6.449730 5.700285 0.000110	6.695097 5.700222 -0.262470	-0.562870 0.637364 -0.526255	10.365694 9.054336 -0.126150	1.0639E-05 1.0446E+01 3.0485E+00	
	16	14.149670 12.500290 0.000067	14.375702 12.500507 0.242615	6.694845 5.700511 0.262948	6.449730 5.700285 0.000110	-0.563488 0.638059 0.524749	10.365811 9.054705 0.126504	2.2396E-05 1.0446E+01 3.0494E+00	
	17	14.375702 12.500507 0.242615	14.713177 12.500645 0.369347	7.060873 5.700585 0.400097	6.694845 5.700511 0.262948	-0.326227 0.371065 0.869417	10.659453 9.054711 0.318924	7.1973E-05 1.0514E+01 2.7502E+00	
	18	14.713177 12.500645 0.369347	15.276810 12.500839 0.508818	7.672016 5.700774 0.551042	7.060873 5.700585 0.400097	-0.231506 0.264734 0.936120	11.129348 9.054922 0.457572	6.5669E-05 1.0666E+01 4.2652E+00	
	19	15.276810 12.500839 0.508818	16.386124 12.501183 0.699075	8.875008 5.701140 0.757006	7.672016 5.700774 0.551042	-0.165823 0.191430 0.967397	12.001476 9.055100 0.629323	8.4445E-05 1.1055E+01 8.1241E+00	
	20	16.386124 12.501183 0.699075	18.569275 12.501400 0.951887	11.242350 5.701373 1.030572	8.875008 5.701140 0.757006	-0.113883 0.134139 0.984397	13.718136 9.055408 0.860394	1.3621E-04 1.1843E+01 1.5715E+01	
	21	18.569275 12.501400 0.951887	22.767334 12.501343 1.243303	15.794575 5.701335 1.345737	11.242350 5.701373 1.030572	-0.068900 0.035681 0.993938	17.045151 9.055490 1.143484	1.9759E-04 1.3383E+01 2.9933E+01	
	22	22.767334 12.501343	26.764664 12.500942	20.129074 5.700935	15.794575 5.701335	-0.033862 0.049692	21.318008 9.055271	2.2580E-04 1.2907E+01	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
3	23	26.764664 12.500342 1.379380	30.563680 12.500050 1.398641	24.253937 5.700066 1.512195	20.129074 5.700935 1.492344	-0.004927 0.021343 0.999760	25.385406 9.054636 1.446403	2.4690E-04 1.2459E+01 2.6970E+01	LIFT
	24	30.568680 12.500050 1.398641	34.197144 12.498779 1.293174	28.188354 5.698837 1.396605	24.253937 5.700066 1.512195	0.029211 -0.010523 0.999518	29.260468 9.053576 1.400885	2.9478E-04 1.2047E+01 2.5734E+01	
	25	34.197144 12.498779 1.293174	37.660538 12.497440 1.102670	31.943802 5.697553 1.188775	28.188354 5.698837 1.396605	0.055053 -0.033558 0.997919	32.957901 9.052282 1.245944	3.0412E-04 1.1663E+01 2.4603E+01	
	26	37.660538 12.497440 1.102670	40.969574 12.496159 0.863799	35.531891 5.696308 0.928654	31.943802 5.697553 1.188775	0.072058 -0.048043 0.996243	36.488815 9.050998 1.021482	2.6572E-04 1.1304E+01 2.3545E+01	
	27	40.969574 12.496159 0.863799	44.134689 12.495140 0.604267	38.963943 5.695264 0.646631	35.531891 5.696308 0.928654	0.081668 -0.055860 0.995093	39.864227 9.049850 0.761199	1.4390E-04 1.0970E+01 2.2546E+01	
	28	44.134689 12.495140 0.604267	47.166641 12.494350 0.352488	42.251678 5.694403 0.373683	38.963943 5.695264 0.646631	0.082599 -0.056606 0.994975	43.095215 9.048912 0.494481	1.6764E-05 1.0658E+01 2.1599E+01	
	29	47.166641 12.494350 0.352488	48.633194 12.493332 0.238720	43.842133 5.693274 0.251034	42.251678 5.694403 0.373683	0.076963 -0.052474 0.995652	45.440613 9.047919 0.304094	1.7542E-04 9.3256E+00 1.0444E+01	
	30	48.633194 12.493332 0.238720	50.071442 12.492336 0.127146	45.401779 5.692168 0.130759	43.842133 5.693274 0.251034	0.076964 -0.052373 0.995658	46.955215 9.046903 0.186968	1.7077E-04 9.2221E+00 1.0242E+01	
	31	50.071442 12.492336 0.127146	51.507843 12.492336 0.127146	46.959366 5.692168 0.130759	45.401779 5.692168 0.130759	0.0 0.000531 1.000000	48.453995 9.046373 0.128977	1.7462E-10 9.1393E+00 1.0180E+01	WAKE
4	1	45.393417 5.697910 -0.038600	43.834000 5.698239 -0.170080	39.813812 -0.001825 -0.180282	41.473572 -0.002166 -0.040128	0.083953 -0.057455 -0.994812	42.608078 2.818149 -0.107303	3.3036E-05 7.9774E+00 9.2214E+00	LIFT
	2	43.834000 5.698239 -0.170080	42.245636 5.698571 -0.304154	38.121292 -0.001478 -0.323204	39.813812 -0.001825 -0.180282	0.083954 -0.057433 -0.994813	40.982529 2.818480 -0.244506	3.2768E-05 8.0719E+00 9.4033E+00	
	3	42.245636 5.698571	38.958572 5.698950	34.620728 -0.001085	38.121292 -0.001478	0.084882 -0.058077	39.464355 2.818853	4.5732E-05 9.5250E+00	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
4	4	38.958572 5.698950 -0.584584	35.527313 5.699393 -0.872515	30.966476 -0.000628 -0.928904	34.620728 -0.001085 -0.622035	0.083508 -0.056996 -0.994876	34.994919 2.819253 -0.752254	5.4896E-05 9.8223E+00 2.0300E+01	LIFT
	5	35.527313 5.699393 -0.872515	31.940598 5.699644 -1.141529	27.146820 -0.000362 -1.215317	30.966476 -0.000628 -0.928904	0.074686 -0.049913 -0.995958	31.370773 2.819635 -1.039907	1.5870E-05 1.0141E+01 2.1195E+01	
	6	31.940598 5.699644 -1.141529	28.186661 5.699777 -1.359658	23.148972 -0.000222 -1.447509	27.146820 -0.000362 -1.215317	0.057956 -0.035836 -0.997676	27.579971 2.819817 -1.291426	2.5526E-05 1.0482E+01 2.2145E+01	
	7	28.186661 5.699777 -1.359658	24.253464 5.700019 -1.482820	18.960159 0.000020 -1.578773	23.148972 -0.000222 -1.447509	0.031307 -0.012257 -0.999435	23.610199 2.819999 -1.467670	2.4721E-05 1.0847E+01 2.3162E+01	
	8	24.253464 5.700019 -1.482820	20.129425 5.700222 -1.469813	14.568249 0.000230 -1.565011	18.960159 0.000020 -1.578773	-0.003142 0.019756 -0.999800	19.449356 2.820237 -1.524605	2.1650E-05 1.1238E+01 2.4276E+01	
	9	20.129425 5.700222 -1.469813	15.795284 5.700369 -1.330122	9.952503 0.000382 -1.416315	14.568249 0.000230 -1.565011	-0.032167 0.048063 -0.998326	15.081448 2.820410 -1.445789	1.8365E-05 1.1664E+01 2.5551E+01	
	10	15.795284 5.700369 -1.330122	11.243099 5.700465 -1.021563	5.104603 0.000480 -1.087770	9.952503 0.000382 -1.416315	-0.067380 0.084107 -0.994176	10.492461 2.820537 -1.214341	1.4260E-05 1.2118E+01 2.6948E+01	
	11	11.243099 5.700465 -1.021563	8.875557 5.700500 -0.752752	2.583161 0.000511 -0.801524	5.104603 0.000480 -1.087770	-0.111821 0.131867 -0.984940	6.918997 2.820584 -0.916203	9.3430E-06 1.0370E+01 1.4147E+01	
	12	8.875557 5.700500 -0.752752	7.672251 5.700502 -0.549697	1.301757 0.000506 -0.585292	2.583161 0.000511 -0.801524	-0.163406 0.188675 -0.968350	5.075012 2.820645 -0.672537	8.9407E-08 9.4805E+00 7.3129E+00	
	13	7.672251 5.700502 -0.549697	7.061039 5.700397 -0.399609	0.650739 0.000413 -0.425515	1.301757 0.000506 -0.585292	-0.230059 0.262979 -0.936971	4.137869 2.820507 -0.490189	2.0742E-05 9.0448E+00 3.8387E+00	
	14	7.061039 5.700397 -0.399609	6.695097 5.700222 -0.262470	0.261109 0.000212 -0.279525	0.650739 0.000413 -0.425515	-0.326063 0.370650 -0.869656	3.633449 2.820537 -0.341892	3.0845E-06 8.8739E+00 2.4747E+00	
	15	6.695097 5.700222	6.449730 5.700285	-0.000273 0.000272	0.261109 0.000212	-0.563069 0.637148	3.317585 2.820305	2.3246E-06 8.7969E+00	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
4	16	6.449730 5.700285 0.000110	6.694845 5.700511 0.262948	0.260855 0.000500 0.279938	-0.000229 0.000272 0.000144	-0.563535 0.637673 0.525168	3.317599 2.820574 0.135830	2.4766E-05 8.7969E+00 2.7443E+00	LIFT
	17	6.694845 5.700511 0.262948	7.060873 5.700585 0.400097	0.650649 0.000515 0.425742	0.260855 0.000500 0.279938	-0.325726 0.370241 0.869956	3.633260 2.820754 0.342293	5.7980E-05 8.8739E+00 2.4758E+00	
	18	7.060873 5.700585 0.400097	7.672016 5.700774 0.551042	1.301594 0.000696 0.586282	0.650649 0.000515 0.425742	-0.231173 0.264167 0.936363	4.137738 2.820723 0.490950	5.5075E-05 9.0448E+00 3.8402E+00	
	19	7.672016 5.700774 0.551042	8.875008 5.701140 0.757006	2.582577 0.001080 0.805315	1.301594 0.000696 0.586282	-0.165595 0.191028 0.967516	5.074684 2.821110 0.675129	6.6474E-05 9.4805E+00 7.3146E+00	
	20	8.875008 5.701140 0.757006	11.242350 5.701373 1.030572	5.103908 0.001324 1.096193	2.582577 0.001080 0.805315	-0.113679 0.133796 0.984467	6.918338 2.821313 0.922570	1.1507E-04 1.0370E+01 1.4151E+01	
	21	11.242350 5.701373 1.030572	15.794575 5.701335 1.345737	9.951834 0.001299 1.431185	5.103908 0.001324 1.096193	-0.068747 0.085423 0.993970	10.491757 2.821451 1.226317	1.5503E-04 1.2118E+01 2.6953E+01	
	22	15.794575 5.701335 1.345737	20.129074 5.700935 1.492344	14.567917 0.000913 1.586620	9.951834 0.001299 1.431185	-0.033681 0.049429 0.998210	15.080944 2.821235 1.464442	1.6795E-04 1.1665E+01 2.5557E+01	
	23	20.129074 5.700935 1.492344	24.253937 5.700066 1.512195	18.960617 0.000064 1.606991	14.567917 0.000913 1.586620	-0.004717 0.021072 0.999767	19.449432 2.820621 1.550032	1.8489E-04 1.1239E+01 2.4285E+01	
	24	24.253937 5.700066 1.512195	28.188354 5.698837 1.396605	23.150620 -0.001123 1.482943	18.960617 0.000064 1.606991	0.029478 -0.010833 0.999507	23.611267 2.819572 1.500157	2.2962E-04 1.0848E+01 2.3172E+01	
	25	28.188354 5.698837 1.396605	31.943802 5.697553 1.183775	27.149987 -0.002365 1.260544	23.150620 -0.001123 1.482943	0.055352 -0.033897 0.997892	27.582382 2.818346 1.332630	2.5964E-04 1.0482E+01 2.2154E+01	
	26	31.943802 5.697553 1.188775	35.531891 5.696308 0.928654	30.970825 -0.003573 0.982453	27.149887 -0.002365 1.260544	0.072351 -0.048401 0.996204	31.374573 2.817116 1.090433	2.6429E-04 1.0141E+01 2.1202E+01	
	27	35.531891 5.696308	38.963943 5.695264	34.625857 -0.004604	30.970825 -0.003573	0.081872 -0.056197	34.999786 2.815949	2.0953E-04 9.8224E+00	

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

N	M	X Y Z	X Y Z	X Y Z	X Y Z	NX NY NZ	XO YO ZO	D T A	TYPE OF ELEMENT
4	28	38.963943 5.695264 0.646631	42.251678 5.694403 0.373683	38.127136 -0.005499 0.390190	34.625854 -0.004604 0.681235	0.082640 -0.056887 0.994955	38.469955 2.815001 0.523068	8.8066E-05 9.5250E+00 1.9450E+01	LIFT
	29	42.251678 5.694403 0.373683	43.842133 5.693274 0.251034	39.820908 -0.006698 0.259664	38.127136 -0.005499 0.390190	0.076717 -0.052622 0.995663	40.989090 2.813983 0.318709	2.2218E-05 8.0720E+00 9.4054E+00	
	30	43.842133 5.693274 0.251034	45.401779 5.692168 0.130759	41.481857 -0.007874 0.131664	39.820908 -0.006698 0.259664	0.076718 -0.052608 0.995664	42.615829 2.812835 0.193305	2.1324E-05 7.9775E+00 9.2233E+00	
	31	45.401779 5.692168 0.130759	46.959366 5.692168 0.130759	43.140656 -0.007874 0.131664	41.481857 -0.007874 0.131664	0.0 0.000159 1.000000	44.225616 2.812255 0.131216	3.4925E-10 7.9053E+00 9.1668E+00	WAKE
		**********		**********			**********		

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

TABLE OF INPUT INFORMATION

INPUT SECTION NO.	SECTION TYPE	TOTAL NO. OF ELEMENTS IN EACH SECTION	EXTRA STRIPS	STRIP NO.	SOURCE ELEMENTS IN THE STRIP	WAKE ELEMENTS IN THE STRIP
1	1	124	0	1	30	1
				2	30	1
				3	30	1
				4	30	1

TOTAL NO. OF ELEMENTS INPUT = 124

END OF THE SUBROUTINE INPUT . TIME IS 35.743 SEC.

TOTAL INDICES SAVED FOR P. KUTTA = 8 THEY ARE

1 30 31 60 61 90 91120

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

---------- * ----------

BEGINNING THE VFORM ROUTINE TIME IS 35.75 SEC

---------- * ----------

BODY SECTION NO. = 1 TYPE = 1 TOTAL NO. OF POINTS = 124 NO. OF STRIPS = 4

LIFTING SECTION NO. 1 NO. OF SOURCE ELEMENTS 30

NO. OF WAKE ELEMENTS 1 TOTAL NO. OF ELEMENTS PER STRIP 31

TOTAL NO. OF CONTROL POINTS (INCL. OFF BODY POINTS) = 120

LIFTING STRIP NO. 1, NO. OF IGNORE ELEMENTS 0

LIFTING STRIP NO. 2, NO. OF IGNORE ELEMENTS 0

LIFTING STRIP NO. 3, NO. OF IGNORE ELEMENTS 0

LIFTING STRIP NO. 4, NO. OF IGNORE ELEMENTS 0

TOTAL NO. OF ELEMENTS IN THE LIFTING SECTION = 124

TIME FOR THE FORMATION OF THE LIFTING VELOCITY MATRIX = 0.33MIN

NO. OF FAR ELEMENTS = 2228 NO. OF INTERMEDIATE ELEMENTS = 10301 NO. OF NEAR ELEMENTS = 17231

END OF THE VFORM ROUTINE TIME IS 55.46 SEC

END OF THE AFORM ROUTINE TIME IS 55.76 SEC

THE 120 X 120 MATRIX WITH 5 RIGHT SIDES WAS SOLVED DIRECTLY IN 0.044MINUTES.

160

RRAY

50966E-02-0.69519E-02-0.68610E-02-0.65715E-02

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

FINAL OUTPUT FOR THE FOLLOWING ANGLE OF ATTACK

(0.989707, 0.0 , 0.143106)

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	1	58.587616 25.774582 -0.085490	0.922716 0.068480 0.073325	0.928154 0.861471 0.138529	0.994141 0.073781 0.079001	0.083317 -0.057279 -0.994876	0.055311 0.000006 12.051556
	2	57.374847 25.774933 -0.187082	0.954060 0.051913 0.076907	0.958561 0.918840 0.081160	0.995304 0.054158 0.080231	0.083317 -0.057217 -0.994879	0.068992 0.000006 12.288940
	3	55.496049 25.775223 -0.346118	0.971632 0.048837 0.079852	0.976130 0.952830 0.047170	0.995392 0.050031 0.081804	0.084616 -0.058195 -0.994719	0.072602 -0.000052 25.419357
	4	52.907593 25.775574 -0.564482	0.988087 0.050214 0.079884	0.993577 0.987196 0.012804	0.995481 0.050539 0.080410	0.083237 -0.056978 -0.994900	0.071954 -0.000009 26.529922
	5	50.203735 25.775925 -0.778408	1.002848 0.054315 0.072251	1.006912 1.013872 -0.013872	0.995963 0.053942 0.071755	0.074450 -0.042861 -0.995977	0.071984 -0.000007 27.700378
	6	47.375519 25.776123 -0.965432	1.013383 0.059212 0.056536	1.016684 1.033646 -0.033646	0.996753 0.058240 0.055608	0.057744 -0.035715 -0.997693	0.074157 -0.000003 28.941940
	7	44.413788 25.776291 -1.096384	1.015970 0.067623 0.030848	1.018684 1.037718 -0.037718	0.997336 0.066382 0.030282	0.031150 -0.012130 -0.999441	0.079469 -0.000003 30.271088
	8	41.309555 25.776535 -1.138454	1.002993 0.085665 -0.001554	1.006644 1.013333 -0.013333	0.996372 0.085099 -0.001544	-0.003249 0.019859 -0.999798	0.088639 -0.000003 31.727600
	9	38.050827 25.776657 -1.079350	0.977264 0.108613 -0.026326	0.983634 0.967535 0.032465	0.993524 0.110421 -0.026764	-0.032248 0.048158 -0.998319	0.099926 -0.000003 33.392715
	10	34.627167 25.776749 -0.905475	0.919347 0.152662 -0.040347	0.932257 0.869102 0.130898	0.985080 0.163755 -0.042933	-0.067417 0.084173 -0.994168	0.114790 -0.000003 35.218536
	11	31.961243 25.776896 -0.683963	0.836750 0.224492 -0.064937	0.868772 0.754764 0.245236	0.963142 0.258401 -0.074746	-0.111837 0.131932 -0.984933	0.127852 -0.000004 18.439044

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	12	30.585403	0.734987	0.808177	0.909437	-0.163382	0.136876
		25.776871	0.330757	0.653151	0.409263	0.188720	-0.000006
		-0.502160	-0.059542	0.346849	-0.073674	-0.968345	9.558346
	13	29.386307	0.606649	0.768486	0.789408	-0.230611	0.141658
		25.776764	0.471457	0.590571	0.613438	0.263697	-0.000008
		-0.365988	-0.016624	0.409429	-0.021632	-0.936634	5.016418
	14	29.510147	0.444870	0.796803	0.558319	-0.326396	0.141755
		25.776855	0.651630	0.634895	0.817805	0.371161	-0.000009
		-0.255135	0.111196	0.365105	0.139552	-0.869313	3.235765
	15	29.274490	0.230044	1.241491	0.185296	-0.562865	0.137891
		25.776733	0.891440	1.541300	0.718039	0.637163	-0.000014
		-0.101091	0.832896	-0.541300	0.670883	-0.526503	3.587296
	16	29.274185	1.180350	1.910731	0.617748	-0.563408	-0.023277
		25.776642	-0.185151	3.650895	-0.096901	0.637782	-0.000018
		0.101335	1.491103	-2.650895	0.780383	0.525172	3.588695
	17	29.509979	1.464159	1.730206	0.846234	-0.327376	-0.090635
		25.777130	-0.507622	2.993610	-0.293338	0.372276	0.000002
		0.255706	0.769526	-1.993610	0.444760	0.868457	3.237668
	18	29.886078	1.392914	1.530687	0.909992	-0.232958	-0.103857
		25.777176	-0.427855	2.343004	-0.275518	0.266318	0.000003
		0.367376	0.468762	-1.343004	0.306243	0.935310	5.020103
	19	30.584930	1.315224	1.382976	0.946221	-0.166486	-0.108986
		25.777496	-0.340259	1.932031	-0.244795	0.192145	0.000005
		0.505702	0.294011	-0.932031	0.211523	0.967141	9.563118
	20	31.960510	1.247746	1.287861	0.968852	-0.114424	-0.108190
		25.777786	-0.262588	1.658586	-0.203894	0.134737	0.000006
		0.691465	0.181009	-0.658586	0.140550	0.984253	18.497513
	21	34.626389	1.193115	1.213106	0.983521	-0.069351	-0.102484
		25.777802	-0.195107	1.471626	-0.160832	0.086195	0.000008
		0.919860	0.100183	-0.471626	0.082584	0.993862	35.229919
	22	38.050303	1.145072	1.154892	0.991497	-0.034432	-0.092989
		25.777588	-0.142846	1.333776	-0.123638	0.050332	0.000005
		1.099849	0.046440	-0.333776	0.040445	0.998136	33.435425

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
1	23	41.309692 25.776978 1.166196	1.111901 -0.119618 0.008746	1.118351 1.250709 -0.250709	0.994233 -0.106960 0.007820	-0.005493 0.021992 0.999743	-0.086168 0.000005 31.745087
	24	44.414978 25.775879 1.131399	1.078763 -0.100460 -0.031959	1.083900 1.174841 -0.174841	0.995260 -0.092684 -0.029485	0.028694 -0.009873 0.999540	-0.083786 0.000002 30.290131
	25	47.378967 25.774612 1.003795	1.045348 -0.081385 -0.059776	1.050214 1.102948 -0.102948	0.995367 -0.077494 -0.056918	0.054512 -0.032823 0.997974	-0.083365 0.000001 28.958450
	26	50.207642 25.773346 0.830222	1.013195 -0.063234 -0.075907	1.018000 1.036323 -0.036323	0.995280 -0.062116 -0.074565	0.071682 -0.047386 0.996301	-0.084043 -0.000003 27.711838
	27	52.912460 25.772263 0.622349	0.982629 -0.045690 -0.083058	0.987191 0.974546 0.025454	0.995379 -0.046283 -0.084136	0.081533 -0.035354 0.995133	-0.085379 -0.000008 26.535172
	28	55.501465 25.771469 0.408707	0.954493 -0.030227 -0.081213	0.960410 0.922387 0.077613	0.995921 -0.031473 -0.084561	0.082674 -0.056275 0.994987	-0.085809 -0.000027 25.420090
	29	57.880905 25.770813 0.255693	0.937525 -0.017785 -0.073963	0.940606 0.884740 0.115260	0.996724 -0.018908 -0.078633	0.077540 -0.052597 0.995601	-0.081231 -0.000006 12.291779
	30	58.594437 25.760928 0.161129	0.925237 -0.009017 -0.072532	0.928119 0.861405 0.138595	0.996894 -0.009715 -0.078150	0.077540 -0.052634 0.995599	-0.067477 0.000004 12.054405

THE FORCE COMPONENTS OF THIS STRIP ARE -0.126444E+02 0.146766E+02 0.932154E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.239560E+04 -0.318386E+04 0.783654E+03

2	1	52.213409 16.621246 -0.093088	0.929341 0.07[illegible]16 0.07[illegible]91	0.935391 0.874957 0.125043	0.993532 0.081694 0.078867	0.083700 -0.057365 -0.994838	0.065628 0.000012 11.505564

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	2	50.836182 16.621552 -0.208981	0.960573 0.056520 0.077558	0.965355 0.931911 0.068089	0.995046 0.058549 0.080341	0.083701 -0.057319 -0.994841	0.079125 0.000004 11.731982
	3	48.702682 16.621887 -0.390081	0.978297 0.046347 0.080711	0.982715 0.965728 0.034272	0.995505 0.047162 0.082131	0.084779 -0.058060 -0.994707	0.081304 -0.000036 24.267883
	4	45.763214 16.622269 -0.638545	0.993341 0.037886 0.081118	0.997368 0.994742 0.005258	0.995963 0.037986 0.081332	0.083408 -0.056984 -0.994885	0.078508 -0.000009 25.328110
	5	42.692657 16.622574 -0.882073	1.003781 0.031704 0.073668	1.006979 1.014007 -0.014007	0.996824 0.031484 0.073157	0.074665 -0.049934 -0.995958	0.076486 -0.000006 26.445557
	6	39.480942 16.622772 -1.095089	1.009867 0.027743 0.057641	1.011890 1.023922 -0.023922	0.998010 0.027417 0.056963	0.057924 -0.035776 -0.997680	0.076694 -0.000004 27.630402
	7	36.117630 16.622955 -1.244234	1.006653 0.030786 0.031087	1.007603 1.015263 -0.015263	0.999057 0.030553 0.030853	0.031233 -0.012119 -0.999439	0.080058 -0.000002 28.899780
	8	32.592377 16.623138 -1.292250	0.987009 0.048704 -0.002182	0.988212 0.975563 0.023437	0.998782 0.049285 -0.002208	-0.003195 0.019880 -0.999797	0.087126 -0.000004 30.290176
	9	28.891708 16.623322 -1.225304	0.955727 0.078609 -0.027036	0.959335 0.920324 0.079676	0.996239 0.081941 -0.028182	-0.032206 0.048179 -0.998320	0.096013 -0.000003 31.380539
	10	25.003708 16.623428 -1.029099	0.899793 0.134991 -0.049563	0.911211 0.830306 0.169694	0.987469 0.148144 -0.054392	-0.067397 0.084206 -0.994167	0.108532 -0.000003 33.623611
	11	21.976151 16.623489 -0.776467	0.827274 0.211061 -0.065540	0.856293 0.733237 0.266763	0.966111 0.246482 -0.076656	-0.111822 0.131960 -0.984927	0.120478 -0.000005 17.651047
	12	20.413879 16.623550 -0.570042	0.733593 0.314119 -0.062530	0.800462 0.640740 0.359260	0.916462 0.392422 -0.078117	-0.163363 0.188738 -0.968344	0.129503 -0.000005 9.124815

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	13	19.619843 16.623367 -0.415471	0.612943 0.449005 -0.024445	0.760199 0.577903 0.422097	0.806293 0.590642 -0.032157	-0.230398 0.263502 -0.936741	0.134702 -0.000008 4.789724
	14	19.192398 16.623306 -0.289685	0.457664 0.623474 0.094341	0.779151 0.607076 0.392924	0.587388 0.800196 0.121082	-0.326193 0.370993 -0.869461	0.135434 -0.000038 3.088836
	15	18.925003 16.623337 -0.114794	0.244596 0.962946 0.783073	1.190675 1.417706 -0.417706	0.205426 0.724754 0.657671	-0.562849 0.637232 -0.526437	0.133559 -0.000011 3.424759
	16	18.924820 16.623413 0.115117	1.154487 -0.166668 1.442196	1.854871 3.440545 -2.440545	0.622408 -0.089854 0.777518	-0.563509 0.637986 0.524816	-0.019222 -0.000008 3.426737
	17	19.192154 16.623566 0.290349	1.440900 -0.491410 0.752165	1.698066 2.883428 -1.883428	0.848554 -0.289394 0.442954	-0.326815 0.371704 0.868923	-0.084649 0.000005 3.090252
	18	19.619568 16.623718 0.416796	1.375124 -0.417565 0.459430	1.508775 2.276402 -1.276402	0.911418 -0.276757 0.304505	-0.232071 0.265362 0.935803	-0.097162 0.000004 4.792842
	19	20.413422 16.624146 0.573411	1.303409 -0.336857 0.290602	1.377241 1.896794 -0.896794	0.946391 -0.244588 0.211003	-0.166101 0.191747 0.967287	-0.101645 0.000007 9.128746
	20	21.975449 16.624374 0.783817	1.242579 -0.267797 0.180637	1.283879 1.648347 -0.648347	0.967832 -0.208584 0.140696	-0.114116 0.134432 0.984330	-0.100709 0.000008 17.658157
	21	25.002960 16.624435 1.042337	1.194929 -0.211959 0.101405	1.217812 1.483065 -0.483065	0.981210 -0.174049 0.083268	-0.069093 0.085953 0.993900	-0.096114 0.000006 33.632965
	22	28.891174 16.624191 1.245600	1.158556 -0.172567 0.048242	1.172330 1.374357 -0.374357	0.988251 -0.147200 0.041151	-0.034105 0.050038 0.998165	-0.089446 0.000006 31.890930
	23	32.592468 16.623566 1.319770	1.136594 -0.150760 0.008157	1.144603 1.310115 -0.310115	0.991256 -0.131713 0.008309	-0.035185 0.021726 0.999751	-0.085496 0.000006 30.304611

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
2	24	36.118790 16.622513 1.279269	1.104728 -0.128751 -0.033269	1.112473 1.237595 -0.237595	0.993038 -0.113936 -0.029905	0.028948 -0.010075 0.999530	-0.085502 0.000003 28.915787
	25	39.483566 16.621216 1.139165	1.070478 -0.100827 -0.062103	1.077007 1.159945 -0.159945	0.993938 -0.093618 -0.057662	0.054786 -0.033013 0.997952	-0.087027 0.000001 27.644577
	26	42.696686 16.619888 0.935657	1.035347 -0.075485 -0.078277	1.041041 1.083767 -0.083767	0.994530 -0.072509 -0.075191	0.071864 -0.047445 0.996286	-0.089415 -0.000000 26.455521
	27	45.768295 16.618750 0.669211	1.000469 -0.051201 -0.084891	1.005368 1.010765 -0.010765	0.995127 -0.050928 -0.084438	0.081606 -0.055251 0.995132	-0.092454 -0.000005 25.332748
	28	48.708466 16.617935 0.456489	0.969275 -0.030254 -0.082262	0.973230 0.947177 0.052823	0.995936 -0.031087 -0.084525	0.082680 -0.056034 0.995000	-0.094734 -0.000017 24.268860
	29	50.842712 16.617396 0.282807	0.947229 -0.015792 -0.074491	0.950285 0.903041 0.096959	0.996785 -0.016608 -0.078388	0.077430 -0.052172 0.995632	-0.091459 0.000002 11.734755
	30	52.220856 16.616165 0.175587	0.932469 -0.006315 -0.072837	0.935330 0.874843 0.125157	0.996940 -0.006752 -0.077873	0.077430 -0.052093 0.995636	-0.077781 0.000011 11.508350

************* ************ *************

THE FORCE COMPONENTS OF THIS STRIP ARE -0.105642E+02 0.125084E+02 0.102378E+03

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.169397E+04 -0.264829E+04 0.434933E+03

************* ************* *************

3	1	46.947418 9.052237 -0.100577	0.933817 0.070164 0.074696	0.939423 0.882516 0.117484	0.994032 0.074688 0.079512	0.083374 -0.057230 -0.994832	0.066265 -0.000002 10.240279
	2	45.433929 9.052535 -0.228198	0.962861 0.049381 0.07[illegible]8	0.967300 0.935669 0.064331	0.995411 0.050947 0.080997	0.083875 -0.057212 -0.99483[illegible]	0.077903 -0.000003 10.441998

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	3	43.089371	0.979942	0.983972	0.995904	0.084840	0.078443
		9.052909	0.035604	0.963201	0.036184	-0.057894	-0.000026
		-0.427442	0.081535	0.031799	0.082863	-0.994712	21.598770
	4	39.859131	0.993119	0.996785	0.996322	0.083466	0.073998
		9.053311	0.024074	0.993580	0.024151	-0.056834	-0.000007
		-0.700673	0.081950	0.006420	0.082214	-0.994889	22.542343
	5	36.434818	1.002053	1.004936	0.997131	0.074718	0.070564
		9.053637	0.015928	1.009896	0.015850	-0.049834	-0.000007
		-0.988476	0.074385	-0.009896	0.074020	-0.995959	23.537277
	6	32.955368	1.006751	1.008489	0.998277	0.057985	0.069437
		9.053822	0.011200	1.017049	0.011106	-0.035765	-0.000005
		-1.202763	0.058116	-0.017049	0.057627	-0.997677	24.591370
	7	29.259323	1.002607	1.003192	0.999417	0.031281	0.071441
		9.054005	0.014110	1.006393	0.014065	-0.012141	-0.000002
		-1.366858	0.031210	-0.006393	0.031111	-0.999437	25.720978
	8	25.385330	0.983034	0.983544	0.999481	-0.003163	0.076961
		9.054224	0.031576	0.967359	0.032104	0.019866	-0.000005
		-1.419774	-0.002477	0.032641	-0.002519	-0.999798	26.958923
	9	21.318527	0.952658	0.954975	0.997573	-0.032183	0.084013
		9.054403	0.060407	0.911978	0.063255	0.048172	-0.000004
		-1.346317	-0.027792	0.088022	-0.029102	-0.998321	28.374115
	10	17.045883	0.901134	0.909730	0.990550	-0.067389	0.094415
		9.054520	0.113669	0.827609	0.124948	0.084217	-0.000004
		-1.130768	-0.051450	0.172391	-0.056555	-0.994166	29.925583
	11	13.718788	0.837746	0.860584	0.973462	-0.111825	0.104968
		9.054577	0.183908	0.740605	0.213701	0.131990	-0.000005
		-0.853157	-0.070464	0.259395	-0.081879	-0.984923	15.709934
	12	12.001377	0.756124	0.808189	0.935578	-0.163383	0.113456
		9.054564	0.275673	0.653170	0.341100	0.188802	-0.000006
		-0.626292	-0.073827	0.346830	-0.091349	-0.968328	8.121147
	13	11.129565	0.649435	0.762195	0.852058	-0.230200	0.118898
		9.054607	0.396040	0.580942	0.519605	0.263331	-0.000005
		-0.456475	-0.048253	0.419058	-0.063308	-0.996838	4.252945

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
3	14	10.659674	0.509382	0.754178	0.675414	-0.326067	0.120736
		9.054425	0.554300	0.568784	0.734973	0.370919	-0.000006
		-0.318335	0.045442	0.431216	0.060254	-0.869540	2.749021
	15	10.365694	0.296041	1.067246	0.277387	-0.562870	0.123091
		9.054336	0.795552	1.139014	0.745424	0.637364	-0.000008
		-0.126150	0.646894	-0.139014	0.606134	-0.526255	3.048493
	16	10.365811	1.092491	1.700962	0.642278	-0.563488	-0.009665
		9.054705	-0.103968	2.893272	-0.061123	0.638059	0.000014
		0.126504	1.299587	-1.893272	0.764031	0.524749	3.049436
	17	10.659453	1.374524	1.597325	0.860516	-0.326227	-0.070439
		9.054711	-0.421869	2.551448	-0.264110	0.371065	0.000006
		0.318924	0.695816	-1.551448	0.435613	0.869417	2.750227
	18	11.129348	1.322257	1.436539	0.920447	-0.231506	-0.081714
		9.054922	-0.361867	2.063643	-0.251902	0.264734	0.000006
		0.457572	0.429341	-1.063643	0.298872	0.936120	4.265242
	19	12.001476	1.264195	1.326848	0.952781	-0.165823	-0.085729
		9.055100	-0.294489	1.760526	-0.221946	0.191430	0.000007
		0.629323	0.274979	-0.760526	0.207242	0.967397	8.124121
	20	13.718136	1.215921	1.250690	0.972201	-0.113883	-0.085209
		9.055408	-0.236371	1.564224	-0.188992	0.134139	0.000008
		0.860094	0.172886	-0.564224	0.138232	0.984397	15.715233
	21	17.045151	1.180271	1.199458	0.984004	-0.068900	-0.082020
		9.055490	-0.189794	1.438701	-0.158233	0.085681	0.000006
		1.143484	0.098184	-0.438701	0.081857	0.993938	29.932816
	22	21.318008	1.155947	1.167682	0.989950	-0.033862	-0.077655
		9.055271	-0.158278	1.363482	-0.135549	0.049692	0.000007
		1.365917	0.047100	-0.363482	0.040337	0.998190	28.382263
	23	25.385406	1.139600	1.148430	0.992337	-0.004927	-0.075648
		9.054636	-0.141642	1.318823	-0.123338	0.021343	0.000005
		1.446403	0.008645	-0.318823	0.007528	0.999760	26.970291
	24	29.260468	1.114990	1.122222	0.993556	0.029211	-0.077281
		9.053576	-0.122604	1.259381	-0.109251	-0.010523	0.000007
		1.400885	-0.032970	-0.259381	-0.030181	0.999519	25.733673

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	QCX QCY QCZ	NX NY NZ	SIG VN AREA
3	25	32.957901	1.083285	1.080794	0.994027	0.055053	-0.080212
		9.052282	-0.100788	1.187652	-0.092483	-0.033558	0.000005
		1.245944	-0.063147	-0.187652	-0.057944	0.997919	24.602600
	26	36.488815	1.048337	1.054263	0.994379	0.072058	-0.083913
		9.050598	-0.078277	1.111471	-0.074248	-0.048043	0.000005
		1.021482	-0.079596	-0.111471	-0.075499	0.996243	23.545273
	27	39.864227	1.011734	1.016889	0.994931	0.081668	-0.088282
		9.049850	-0.055137	1.034062	-0.054221	-0.055860	0.000003
		0.761199	-0.086127	-0.034062	-0.084696	0.995093	22.546005
	28	43.095215	0.977527	0.981622	0.995828	0.082599	-0.092093
		9.048912	-0.033517	0.963582	-0.034144	-0.056606	-0.000005
		0.494481	-0.083062	0.036418	-0.084617	0.994975	21.599319
	29	45.440613	0.953983	0.957082	0.996762	0.076963	-0.090371
		9.047919	-0.018492	0.916006	-0.019322	-0.052474	0.000009
		0.304094	-0.074708	0.083994	-0.078058	0.995652	10.444393
	30	46.955215	0.936512	0.939366	0.996961	0.076964	-0.078495
		9.046903	-0.007584	0.882409	-0.008074	-0.052373	0.000010
		0.186968	-0.072781	0.117591	-0.077479	0.995658	10.242451
		**********		**********		**********	

THE FORCE COMPONENTS OF THIS STRIP ARE -0.682528E+01 0.826575E+01 0.890425E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.799338E+03 -0.169092E+04 0.163754E+03

		**********		**********		**********	
4	1	42.608078	0.938689	0.943472	0.994931	0.083953	0.064970
		2.818149	0.056882	0.890139	0.060291	-0.057455	-0.000006
		-0.107303	0.075938	0.109861	0.080438	-0.994812	9.221400
	2	40.982529	0.967093	0.971072	0.995903	0.083954	0.073959
		2.818480	0.037376	0.942980	0.038489	-0.057433	-0.000009
		-0.244506	0.079465	0.057020	0.081832	-0.994813	9.403310
	3	38.464355	0.985981	0.989787	0.996155	0.084982	0.072251
		2.818853	0.026359	0.979678	0.026631	-0.058077	-0.000006
		-0.458642	0.080705	0.020322	0.083458	-0.994697	19.449631

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE I WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	4	34.994919 2.819253 -0.752254	0.997499 0.020547 0.082558	1.001120 1.002241 -0.002241	0.996383 0.020524 0.082465	0.083508 -0.056996 -0.994876	0.065723 -0.000006 20.299805
	5	31.370773 2.819635 -1.039907	1.004136 0.016938 0.074453	1.007034 1.014117 -0.014117	0.997122 0.016819 0.073933	0.074686 -0.049913 -0.995958	0.060709 -0.000002 21.195053
	6	27.579971 2.819817 -1.291426	1.006063 0.015478 0.057890	1.007845 1.015752 -0.015752	0.998231 0.015357 0.057440	0.057956 -0.035836 -0.997676	0.058188 -0.000002 22.144699
	7	23.610159 2.819959 -1.467670	0.998865 0.013632 0.031054	0.999541 0.999081 0.000919	0.999324 0.013641 0.031068	0.031307 -0.012257 -0.999435	0.058697 -0.000006 23.162003
	8	19.449356 2.820237 -1.524605	0.976629 0.034520 -0.002382	0.977242 0.955001 0.044999	0.999373 0.035324 -0.002437	-0.003142 0.019756 -0.999800	0.062354 -0.000005 24.276352
	9	15.081448 2.820410 -1.445789	0.945019 0.055856 -0.027756	0.947075 0.896951 0.103049	0.997829 0.058977 -0.029307	-0.032167 0.048063 -0.998326	0.067029 -0.000004 25.550674
	10	10.492461 2.820537 -1.214341	0.897961 0.094675 -0.052846	0.904484 0.818091 0.181909	0.992789 0.104673 -0.058427	-0.067380 0.084107 -0.994176	0.074272 -0.000003 26.947662
	11	6.919997 2.820584 -0.916203	0.844208 0.147818 -0.076048	0.860419 0.740320 0.259680	0.981159 0.171798 -0.088385	-0.111821 0.131867 -0.984940	0.082152 -0.000005 14.146786
	12	5.075012 2.820645 -0.672537	0.779674 0.218207 -0.089047	0.814515 0.663435 0.336565	0.957225 0.267898 -0.109325	-0.163406 0.188675 -0.968350	0.089382 -0.000005 7.312872
	13	4.137869 2.820527 -0.490189	0.693978 0.313174 -0.082492	0.765825 0.586489 0.413511	0.906183 0.408237 -0.107717	-0.230059 0.262979 -0.936971	0.094864 -0.000005 3.538659
	14	3.633449 2.820537 -0.341892	0.577549 0.444237 -0.027199	0.729143 0.531649 0.468351	0.792093 0.609259 -0.037303	-0.326063 0.370650 -0.869654	0.098076 -0.000007 2.474733

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	15	3.317585 2.820305 -0.135480	0.365043 0.685961 0.439899	0.892922 0.797310 0.202690	0.408819 0.768220 0.492651	-0.563069 0.637148 -0.526304	0.106772 -0.000006 2.744631
	16	3.317599 2.820574 0.135830	0.989752 -0.014184 1.079309	1.464486 2.144718 -1.144718	0.675836 -0.009685 0.736938	-0.563535 0.637673 0.525168	0.004392 0.000014 2.744296
	17	3.623260 2.820754 0.342293	1.264050 -0.317524 0.608426	1.438341 2.063824 -1.068824	0.878825 -0.220757 0.423006	-0.325726 0.370241 0.869956	-0.048968 0.000011 2.475772
	18	4.137738 2.820723 0.490950	1.234999 -0.273396 0.383448	1.322783 1.749757 -0.749757	0.933636 -0.210462 0.289880	-0.231173 0.264167 0.936363	-0.058692 0.000005 3.840194
	19	5.074684 2.821110 0.675129	1.199289 -0.229015 0.250488	1.246388 1.553485 -0.553485	0.962211 -0.183743 0.200971	-0.165595 0.191028 0.967516	-0.062623 0.000006 7.314640
	20	6.918338 2.821313 0.922570	1.171769 -0.184823 0.160433	1.197055 1.432940 -0.432940	0.978877 -0.154398 0.134023	-0.113679 0.133796 0.984467	-0.063475 0.000007 14.151157
	21	10.491757 2.821451 1.226317	1.154451 -0.145766 0.092374	1.167277 1.362537 -0.362537	0.989012 -0.124877 0.079137	-0.068747 0.085423 0.993970	-0.063252 0.000001 26.953278
	22	15.080944 2.821235 1.464442	1.144903 -0.119659 0.044560	1.152000 1.327106 -0.327106	0.993839 -0.103871 0.038680	-0.033681 0.049429 0.998210	-0.062211 0.000004 25.557236
	23	19.449432 2.820621 1.550032	1.138838 -0.106690 0.007625	1.143849 1.308391 -0.308391	0.995619 -0.093272 0.006666	-0.004717 0.021072 0.999767	-0.062567 0.000004 24.285461
	24	23.611267 2.819572 1.500157	1.133295 -0.094108 -0.034145	1.137747 1.271812 -0.271812	0.996053 -0.083448 -0.030277	0.029478 -0.010833 0.999507	-0.065848 0.000005 23.172119
	25	27.582382 2.818346 1.332630	1.098036 -0.080519 -0.068539	1.102821 1.216214 -0.216214	0.995661 -0.073012 -0.057705	0.055352 -0.033897 0.997892	-0.070013 0.000003 22.153610

DOUGLAS AIRCRAFT COMPANY
LONG BEACH DIVISION
MONDAY, MAR 28, 1977

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

ON - BODY POINTS FINAL OUTPUT

N	M	XO YO ZO	VX VY VZ	VT VTSQ CP	DCX DCY DCZ	NX NY NZ	SIG VN AREA
4	26	31.374573	1.066718	1.071869	0.995195	0.072351	-0.074859
		2.817116	-0.067075	1.148902	-0.062578	-0.048401	0.000003
		1.090433	-0.080729	-0.148902	-0.075316	0.996204	21.201508
	27	34.999786	1.030618	1.035704	0.995089	0.081872	-0.080562
		2.815949	-0.052952	1.072681	-0.051127	-0.056197	0.000003
		0.309973	-0.087785	-0.072681	-0.084759	0.995058	20.302734
	28	38.469955	0.992792	0.997154	0.995625	0.082640	-0.086215
		2.815001	-0.038858	0.994316	-0.038969	-0.056887	0.000004
		0.523068	-0.084678	0.005684	-0.084920	0.994955	19.450150
	29	40.789090	0.964158	0.967523	0.996522	0.076717	-0.086603
		2.813983	-0.027629	0.936100	-0.028557	-0.052622	0.000009
		0.318709	-0.075740	0.063900	-0.078283	0.995663	9.405404
	30	42.615829	0.940435	0.943397	0.996859	0.076718	-0.077338
		2.812835	-0.014766	0.882999	-0.015652	-0.052608	0.000005
		0.193305	-0.073237	0.110001	-0.077631	0.995664	9.223297

THE FORCE COMPONENTS OF THIS STRIP ARE -0.281661E+01 0.373882E+01 0.747596E+02

THE MOMENT COMPONENTS OF THIS STRIP ARE 0.205375E+03 -0.104239E+04 0.258819E+02

THE FORCE COMPONENTS OF THE SECTION ARE -0.328505E+02 0.391895E+02 0.359396E+03

THE MOMENT COMPONENTS OF THE SECTION ARE 0.509429E+04 -0.856545E+04 0.140822E+04

THE FORCE COMPONENTS OF THE ENTIRE BODY ARE -0.328505E+02 0.391895E+02 0.359396E+03

THE MOMENT COMPONENTS OF THE ENTIRE BODY ARE 0.509429E+04 -0.856545E+04 0.140822E+04

FOUR STRIP NACA SWEPT WING. A=8.22. 1 PL. SYM. DISPMNT. 30 SOURCE 1 WK.

UNIFORM ONSET FLOW = (0.989707E+00, 0.0 , 0.143106E+00)

STRIP NO.	B (STRIP)
1	-0.609664E-02
2	-0.695191E-02
3	-0.686101E-02
4	-0.657148E-02

********** ********** **********

TOTAL RUN TIME FOR THIS CASE WAS 0.98728 MINUTES.

9.0 REFERENCES

1. Hess, J.L.: Calculation of Potential Flow About Arbitrary Three-Dimensional Lifting Bodies. Final Technical Report. Douglas Aircraft Company Report No. MDC J5679-01, October 1972.

2. Cebeci, T., Smith, A.M.O., and Wang, L.C.: A Finite-Difference Method for Calculating Compressible Laminar and Turbulent Boundary Layers. Douglas Aircraft Company Report No. DAC 67131, March 1969.

3. Keller, H.B. and Cebeci, T.: Simple Accurate Numerical Procedures for Boundary Layers. II. Two-Dimensional Turbulent Flows. AIAA Journal, Vol. 10, No. 9, September 1972.

4. Hess, J.L.: A Fully Automatic Combined Potential-Flow-Boundary-Layer Procedure for Calculating Viscous Effects on the Lifts and Pressure Distribution of Arbitrary Three-Dimensional Configurations. McDonnell Douglas Corp. Report MDC J7491, April 1977.

5. Hess, J.L. anc Smith, A.M.O.: Calculation of Nonlifting Potential Flow about Arbitrary Three-Dimensional Bodies. Douglas Aircraft Company Report No. ES 40622, March 1962.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* User's Manual for a Fully Automatic Three-Dimensional Potential-Flow Calculation Method. Part 1. Viscous Correction by Two-Dimensional Boundary-Layer Analysis		5. TYPE OF REPORT & PERIOD COVERED Final Technical Report October 1973 - March 1977 6. PERFORMING ORG. REPORT NUMBER MDC J7644/01
7. AUTHOR(s) Mack, Dun-Pok Schimke, Suzanne M.		8. CONTRACT OR GRANT NUMBER(s) N00014-74-C-0059
9. PERFORMING ORGANIZATION NAME AND ADDRESS Douglas Aircraft Company 3855 Lakewood Blvd. Long Beach, California 90846		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Ship Research and Development Center Bethesda, Maryland 20084		12. REPORT DATE 1 August 1977 13. NUMBER OF PAGES 175
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for Public Release; Distribution Unlimited

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Boundary-Layer	Lifting Bodies	Viscous Flow
Computer Program	Potential Flow	Vorticity
Input-Output	Pressure Distribution	Wing-Body
Kutta Condition	Three-Dimensional Flow	

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report describes a computer program which calculates the viscous effects on the lift and pressure distributions of arbitrary three-dimensional bodies. The program is a combination of a panel method which computes the potential flow about arbitrary three-dimensional lifting configurations, and a two-dimensional boundary-layer method, which calculates the viscous-effects. These effects are applied to the three-dimensional shape in a "strip-theory" sense and the resultant viscous lift and pressure distributions are produced. Two methods of simulating the boundary layer in the final potential-flow calculation are

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-014-6601

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

20. Abstract (cont.)

available: 1) addition of the displacement thickness to the original shape, and 2) defining a surface blowing distribution on the body.

The computer program is written in Fortran IV for the IBM 370 systems. 16 temporary external units are used for storage. The region size needed to execute the program is about 360K bytes, but this is a direct function of the number of elements defining the configuration.

Also presented in this report is a detailed description of the program logic, complete instructions for executing the program, and a sample case. The basic description of the method, its background and capabilities is contained in McDonnell Douglas Report MDC J7491, "A Fully Automatic Combined Potential-Flow Boundary-Layer Procedure for Calculating Viscous Effects on the Lifts and Pressure Distributions of Arbitrary Three-Dimensional Configurations" by John L. Hess.